

Service Manual

Panaboard
Electronic Print Board

KX-B620

KX-B620A

KX-B620C

KX-B620G

KX-B620H

KX-B620T

KX-B620U

KX-B520

KX-B520A

KX-B520C

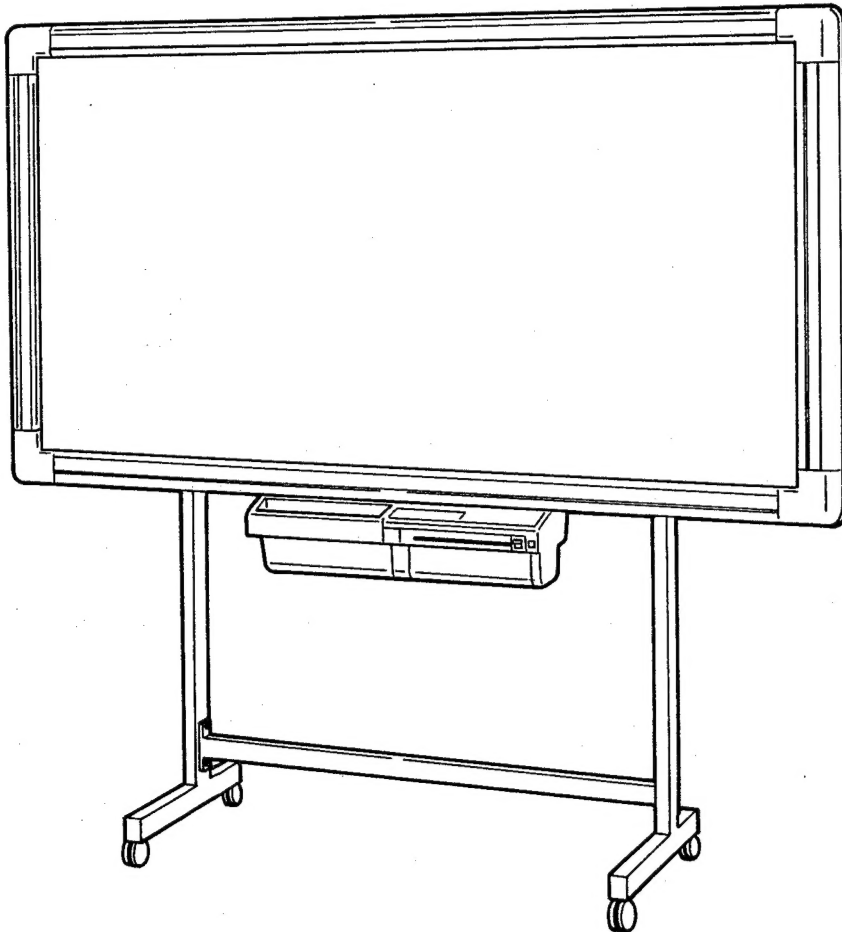
KX-B520G

KX-B520H

KX-B520S

KX-B520T

KX-B520U



(This picture is KX-B620. Stand is optional.)

Panasonic

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WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Please use this manual for KX-B620 Series (all models) and KX-B520 Series with "a" mark on the nameplate (see below):

NAMEPLATE

Panasonic
ELECTRONIC PRINT BOARD
MODEL NO. KX-B520

POWER SOURCE :

Matsushita Electric Industrial Co., Ltd.
Made in Japan

a

Panasonic
ELECTRONIC PRINT BOARD
MODEL NO. KX-B620

POWER SOURCE :

Matsushita Electric Industrial Co., Ltd.
Made in Japan

CONTENTS

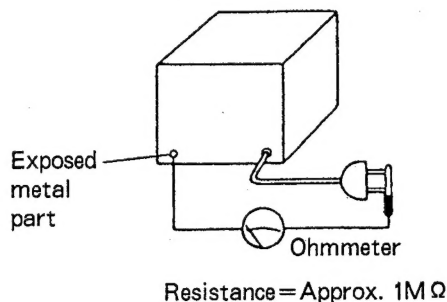
| | Page |
|---|-------|
| 1. SAFETY PRECAUTIONS | 2 |
| 2. INSULATION RESISTANCE TEST..... | 2 |
| 3. FOR SERVICE TECHNICIANS | 2 |
| 4. SPECIFICATIONS | 3 |
| 5. EXTERNAL DIMENSIONS | 4 |
| 6. EXTERNAL PARTS (With optional stand) | 4 |
| 7. COMPONENT LOCATION | 5 |
| 8. OPERATOR CONTROLS/INDICATORS | 5 |
| 9. UNPACKING/INSTALLATION..... | 6—14 |
| 10. TROUBLESHOOTING GUIDE | 15—20 |
| 11. DISASSEMBLY AND EXCHANGE | 21—24 |
| 12. ADJUSTMENTS | 25—30 |
| 13. CIRCUIT OPERATIONS | 31—60 |
| 1. GENERAL BLOCK DIAGRAM AND FLOWCHART..... | 31—34 |
| 2. CONTROL SECTION | 35—58 |
| 3. POWER SUPPLY UNIT | 59—60 |
| 14. SCHEMATIC DIAGRAM | 61—62 |
| 15. CIRCUIT BOARD | 63 |
| 16. MECHANICAL PARTS LOCATION..... | 64 |
| 17. REPLACEMENT PARTS LIST | 65—69 |

1. SAFETY PRECAUTIONS

- 1) Before servicing, unplug the power cord to prevent an electric shock.
- 2) When replacing parts, use only manufacturer's recommended components for safety.
- 3) Check the condition of the power cord. Replace it if wear or damage is evident.
- 4) After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
- 5) Before returning the serviced equipment to the customer, make the following insulation resistance test to prevent a shock hazard.

2. INSULATION RESISTANCE TEST

- 1) Unplug the power cord and check for continuity between earth ground on the plug and the metal cabinet part.
- 2) With the unit unplugged, short the two prongs of the plug with a jumper wire.
- 3) Turn on the power switch.
- 4) Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads, etc.
Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.
- 5) If the measurement is outside the specified limits (approx. $1\text{M}\Omega$), there is a possibility of a shock hazard.



3. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help to prevent recurring malfunctions.

- 1) Cover the plastic parts with aluminum foil.
- 2) Ground the soldering irons.
- 3) Use a conductive mat on the work-table.
- 4) Do not grasp IC or LSI pins with bare fingers.

4. SPECIFICATIONS

1. TypeWall mounted (Floor mounted)
2. Copy SystemThermal Head, Heat Sensitive
3. Copy PaperHeat Sensitive, Roll Paper
4. Copy Paper Size297×210 mm (A4 size), 279.4×215.9 mm (Letter size)
5. Copy Size270×170 mm
6. Copy DensityApproximately 8 dots/mm
7. Copy ColorBlack
8. Copy TimeApproximately 18 seconds
9. Paper FeedAutomatic Discharge
10. Board Screen SizeKX-B620 Series: 912×1,762 mm [35.9×69.4 in]
KX-B520 Series: 912×1,400 mm [35.9×55.1 in]
11. Copy AreaKX-B620 Series: 842×1,660 mm [33.1×65.4 in]
KX-B520 Series: 842×1,330 mm [33.1×52.4 in]
12. No. of Screens2 Screens, Endless Roll
13. Screen ScrollSingle Direction, Single-screen Forward
14. Reading SystemCCD Sensor, Flat Scan
15. External DimensionsKX-B620 Series: 1,912(W)×165(D)×1,232(H) mm [75.3×6.5×48.5 in]
KX-B520 Series: 1,550(W)×165(D)×1,232(H) mm [61.0×6.5×48.5 in]
16. WeightKX-B620 Series: 27kg [60 lb] (without optional stand)
KX-B520 Series: 25.5kg [56.2 lb] (without optional stand)
17. Model No.KX-B620/620A/620C/620G/620H/620T/620U
KX-B520/520A/520C/520G/520H/520S/520T/520U a

| | | | | |
|--|----------------------|------------------------|----------------------------|--------------------------|
| | KX-B620T KX-B520T | KX-B620/C KX-B520/C | KX-B620G/H KX-B520G/H/S | KX-B620U/A KX-B520U/A |
| 18. Power Source | AC 110V 60 Hz | AC 120V 60 Hz | AC 220-230V 50/60 Hz | AC 230-240V 50 Hz |
| 19. Power Consumption (During operation at Normal Load) | 1.3A | 1.3A | 0.7A | 0.6A |

20. Environmental Conditions.....Temperature 10°C to 35°C
Humidity 30 to 85%RH
21. Accessories.....Copy Paper 1 roll
Eraser 1 pc.
Markers 1 Black
1 Red
1 Blue
22. Assembly PartsWall-mounting Fixture 1 for Fixing
1 for Adjustment
Frame Cover B 1
Frame Cover C 1
Bracket Frame Fixture (u) 1
Screw (M3) 2 for Frame Cover C
Screw (M4 Short) 5 for Bracket Fixture
Screw (M4 Short) 2
Screw (M4 Long) 2 for attachment of Printer Section
* Screw (M6) 4 for Wall-mounting fixtures

* This screws are not provided with U.S.A. model.

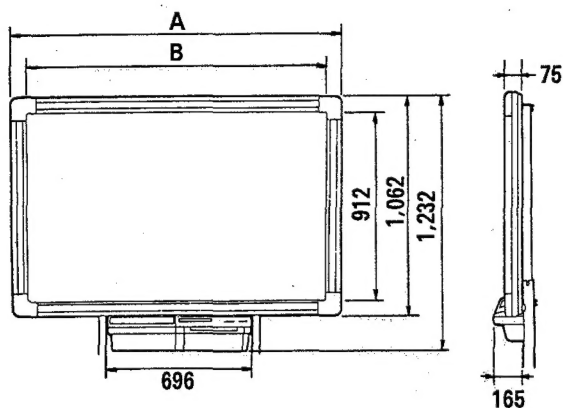
Features

- Any information written on the film screen can be copied on A4 or letter size paper.
- Efficiency will greatly increase during conferences, with little need to take notes.
- Charts, graphs or other materials can be copied on A4 or letter size paper.
- The copies have a binding margin, convenient for filing.

Design and Specifications are subject to change without prior notice.

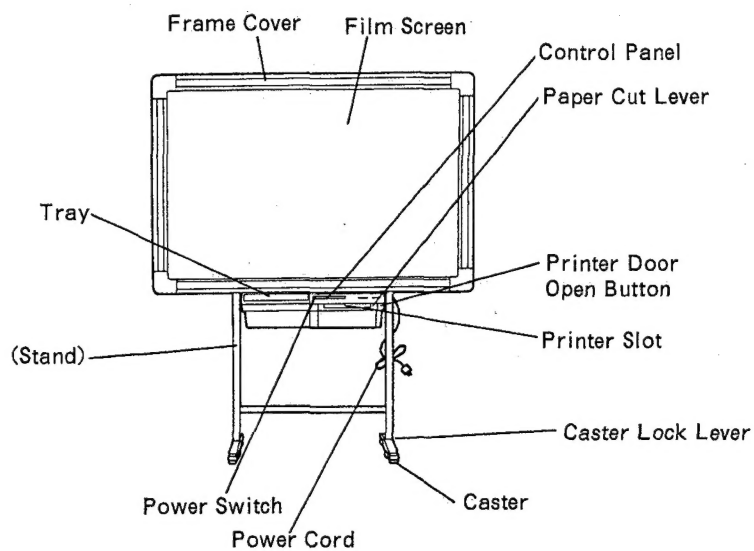
KX-B620 Series
KX-B520 Series

5. EXTERNAL DIMENSIONS



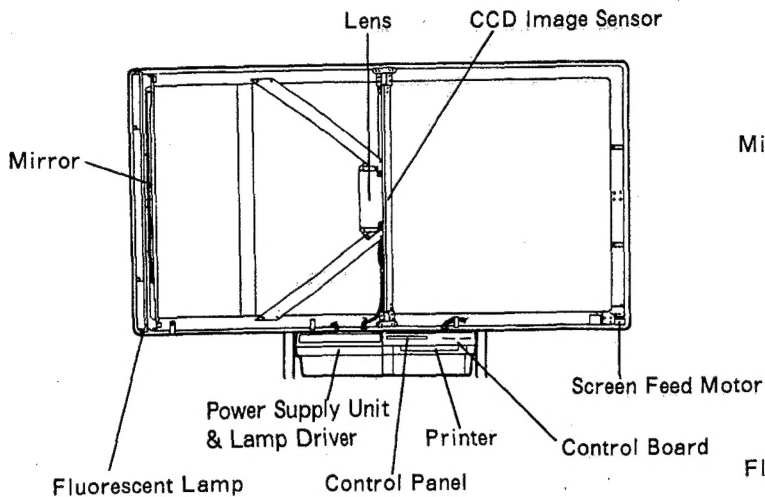
| | KX-B620 Series | KX-B520 Series |
|----------|----------------|----------------|
| Length A | 1,912 | 1,550 |
| Length B | 1,762 | 1,400 |

6. EXTERNAL PARTS (With optional stand)

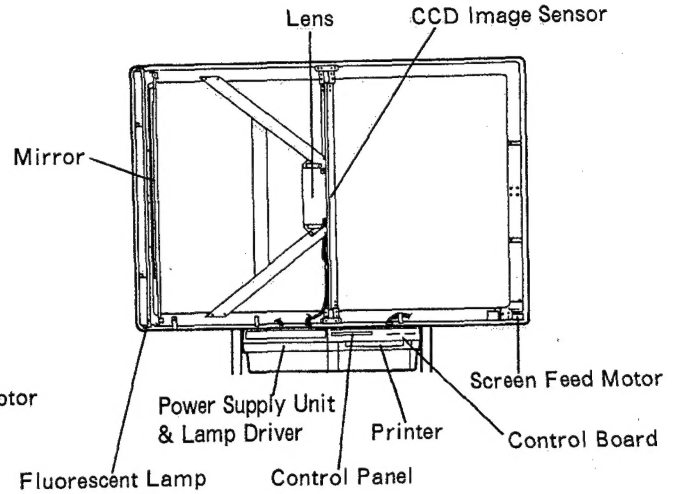


7. COMPONENT LOCATION

KX-B620 Series

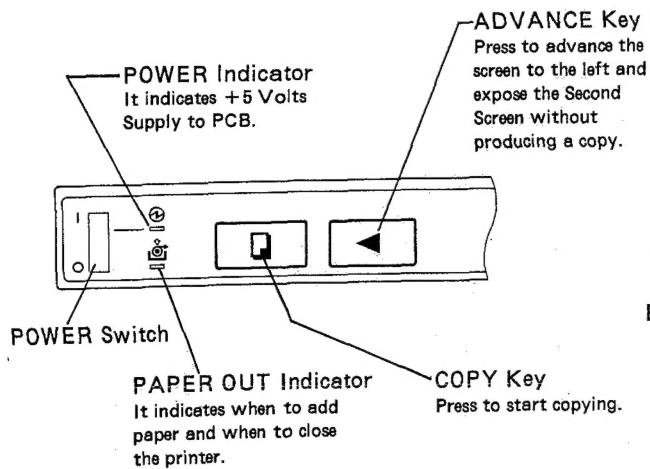


KX-B520 Series

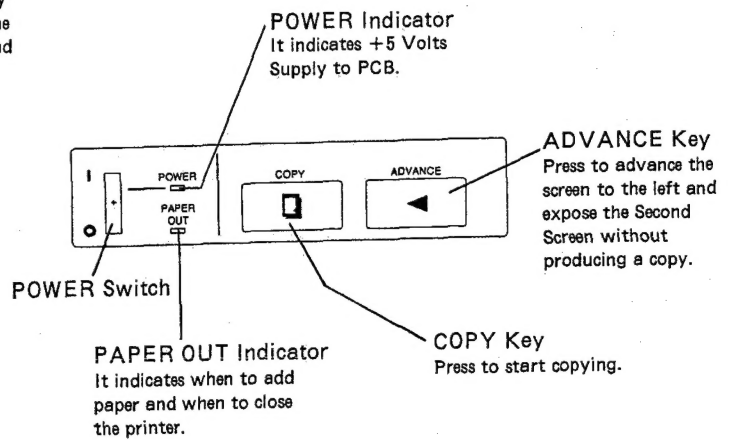


8. OPERATOR CONTROLS/INDICATORS

KX-B620 Series



KX-B520 Series



9. UNPACKING/INSTALLATION

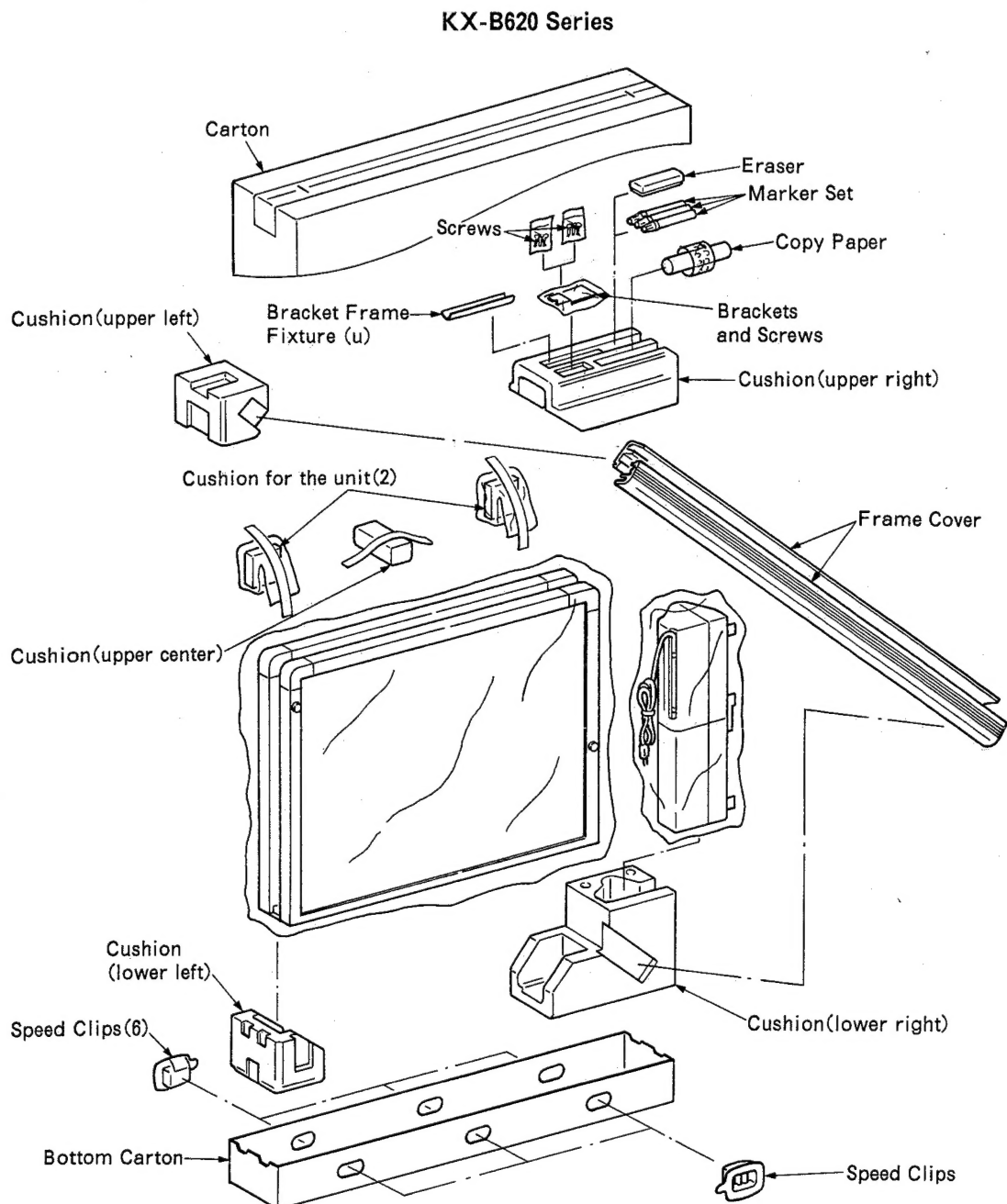
Installation Requirements

The Panaboard is a precision designed machine, which somewhat depends on the surrounding conditions for optimum operation.

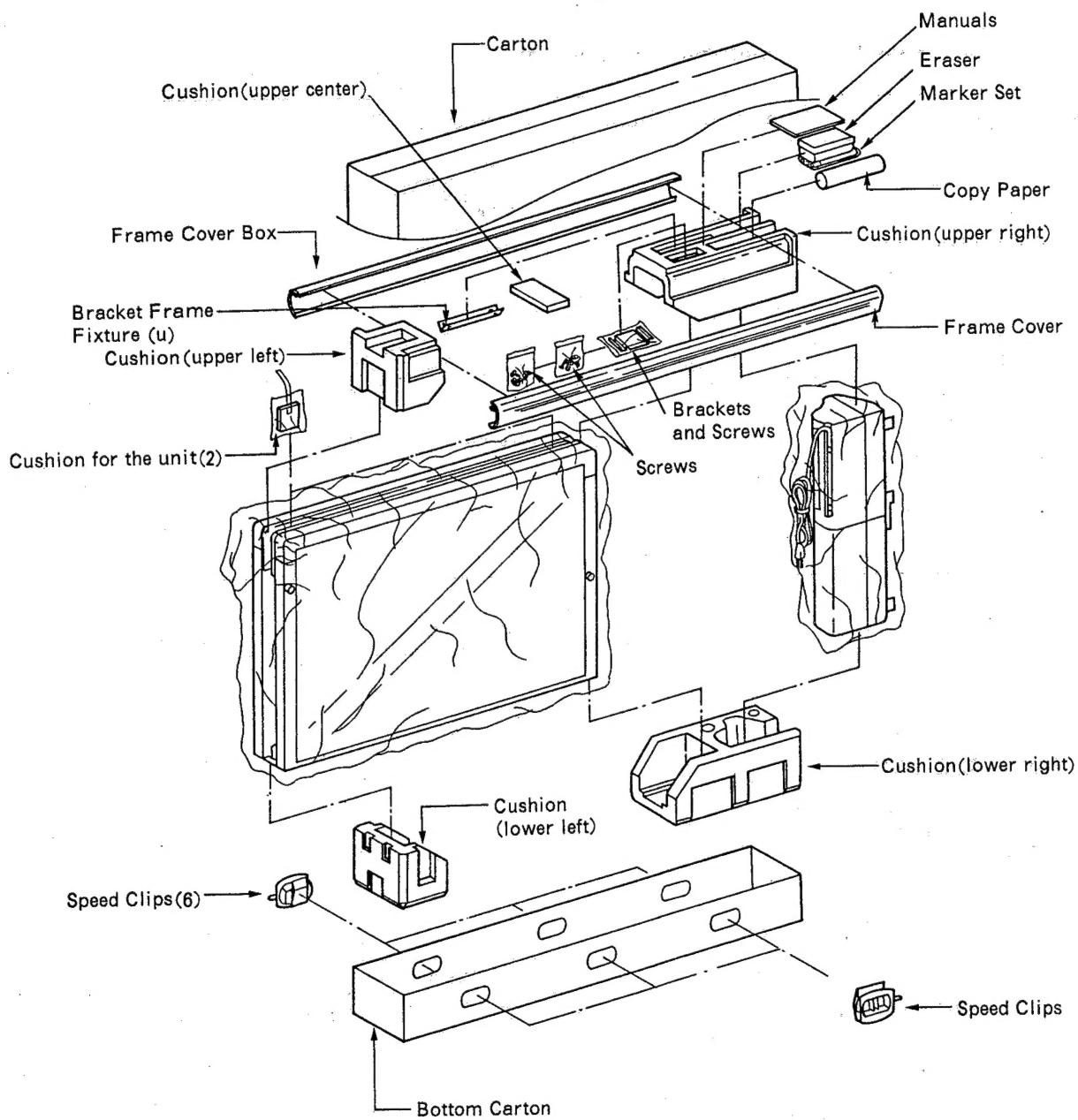
Attention to the following, will result in more reliability and quality performance.

1. The Panaboard should not be installed in areas with the following conditions:
 - (1) High temperature and high humidity or low temperature and low humidity
 - (2) Direct exposure to sunlight
 - (3) Direct in air conditioning flow, or close to heater ducts
 - (4) Uneven floor
2. The Panaboard weights 35 kg (KX-B520 Series: 32 kg), it should be installed on sturdy flat surface.

UNPACKING






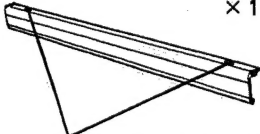


KX-B520 Series



INSTALLATION

The packing box includes the parts noted below; please confirm that all parts are present before beginning work.

● **Accessories for Assembling the Electronic Print Board:**

| Illustration/Q'ty | Order of Use (Step) | Illustration/Q'ty | Order of Use (Step) |
|---|---------------------|--|---------------------|
|  × 1 [Bracket Frame Fixture(u)] | ⑦ |  × 2 [M4×20 mm (13/8")] | ⑮ |
|  × 7 [M4×12 mm (15/32")] | ⑦ ⑮ |  × 1 Mounting holes [Frame Cover C] | ⑰ |
|  × 1 [Frame Cover B] | ⑬ |  × 2 [M3×8 mm (5/16")] | |

Installation/Assembly

Note: ① Assemble Print Board on a flat surface.

② Failure to remove the joint Bracket (with Red Tag) before opening Print Board could result in Hinge damage.

Assembling of the Print Board is as follows:

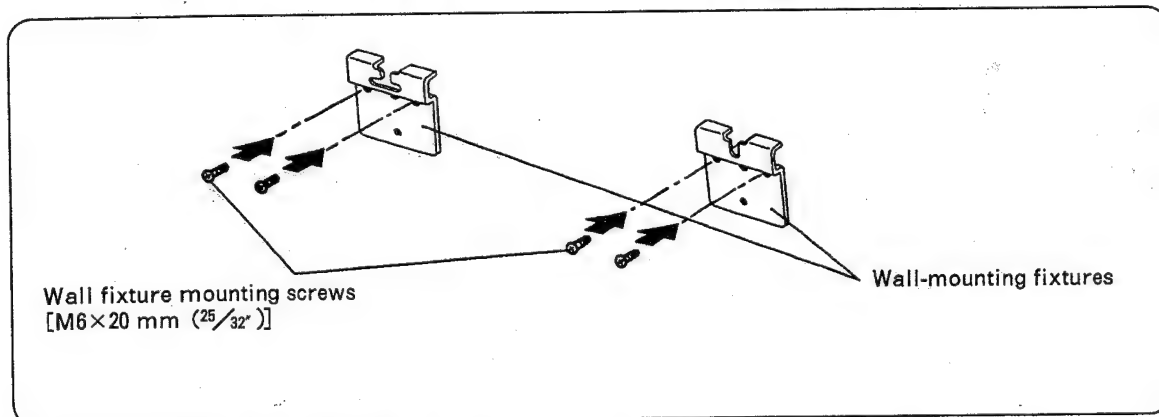
| | Applicable Steps | | | | | | | | | | | | | | | | |
|--|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ⑮ | ⑯ | ⑰ |
| Wall/Floor mounted Type | | | | | | | | | | | | | | | | | |
| Wall mounted Type Installation | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | ○ | ○ | ○ | ○ | ○ |
| Floor mounted Type Installation (One Person Installation) | | ○ | ○ | ○ | ○ | ○ | ○ | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

① Preparation-1 (Wall mounted Type)

Ensure there is a Power Receptacle with in the mounting position of Electronic Print Board.

First confirm that the wall strength is fully sufficient to support the electronic print board.

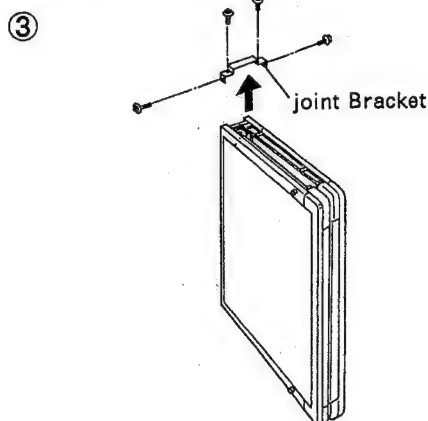
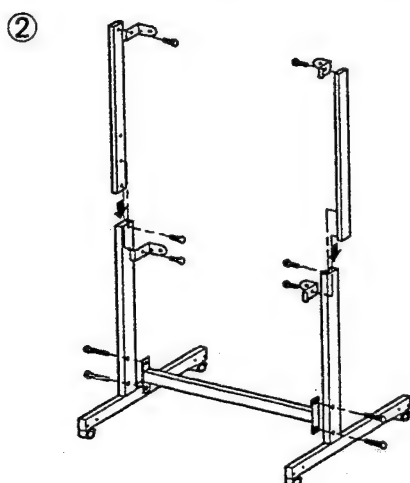
CAUTION: The wall must be capable of supporting at least 87 kg (about 192 lb) for KX-B620
The wall must be capable of supporting at least 82 kg (about 181 lb) for KX-B520



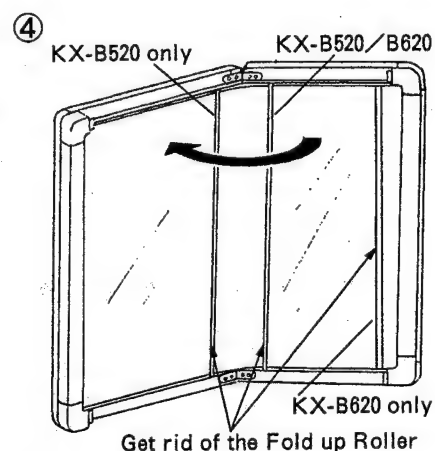
- The wall mounting fixtures can be mounted at one of three intervals: 75 cm (2' 5 1/2"), 100 cm (3' 3 3/8"), 122 cm (4' 1 1/2").
- Be sure the two wall fixtures are level with each other.
- Please use the proper type screw to secure the wall fixtures for the various wall materials.

Only U.S.A.

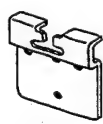
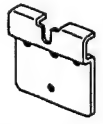

The four screws (installation above) used to secure the wall-mounting fixtures are not provided. Proper mounting screw (E.G. MOLLY BOLTS) should be obtained to properly secure the Wall-mounting fixtures.



See the item
"Assembly of the stand (KX-B06C/06CS)
for the electronic print board (KX-B520)".

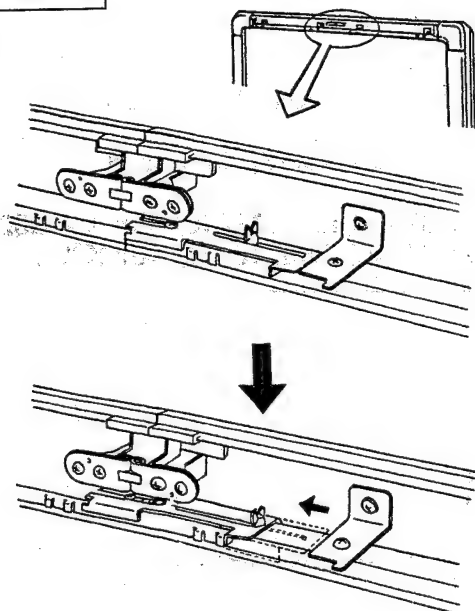


● Accessories for Wall-mounting:

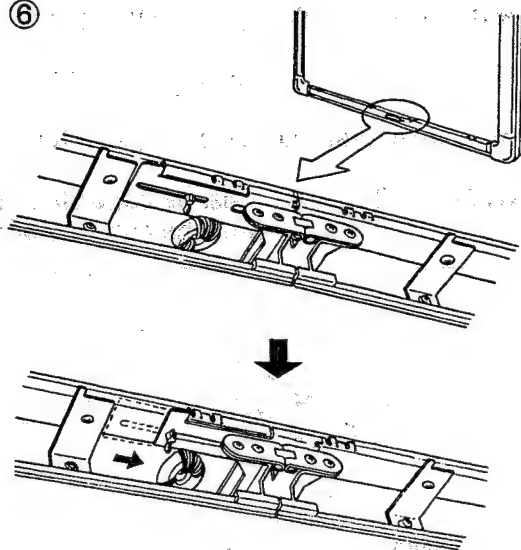
| | | |
|---|---|--|
|  <p>× 1</p> <p>[Wall-mounting Fixture: for Adjustment]</p> |  <p>× 1</p> <p>[Wall-mounting Fixture: for Fixing]</p> |  <p>× 4</p> <p>[M6×20 mm (25/32")]</p> <p>Mounting Screws are not provided with U.S.A. model.</p> |
|---|---|--|

KX-B620 Series
KX-B520 Series

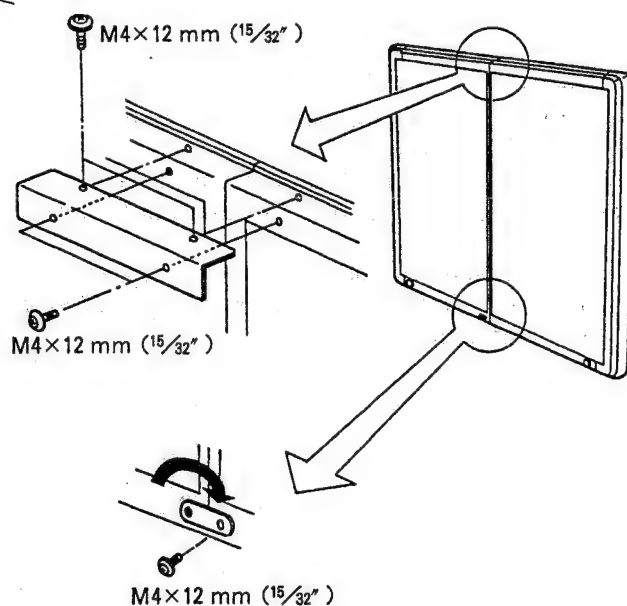
⑤



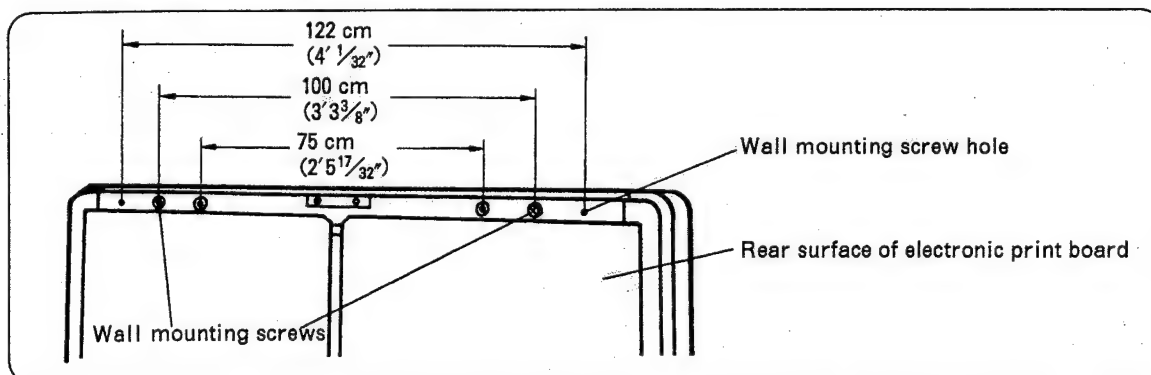
⑥



⑦

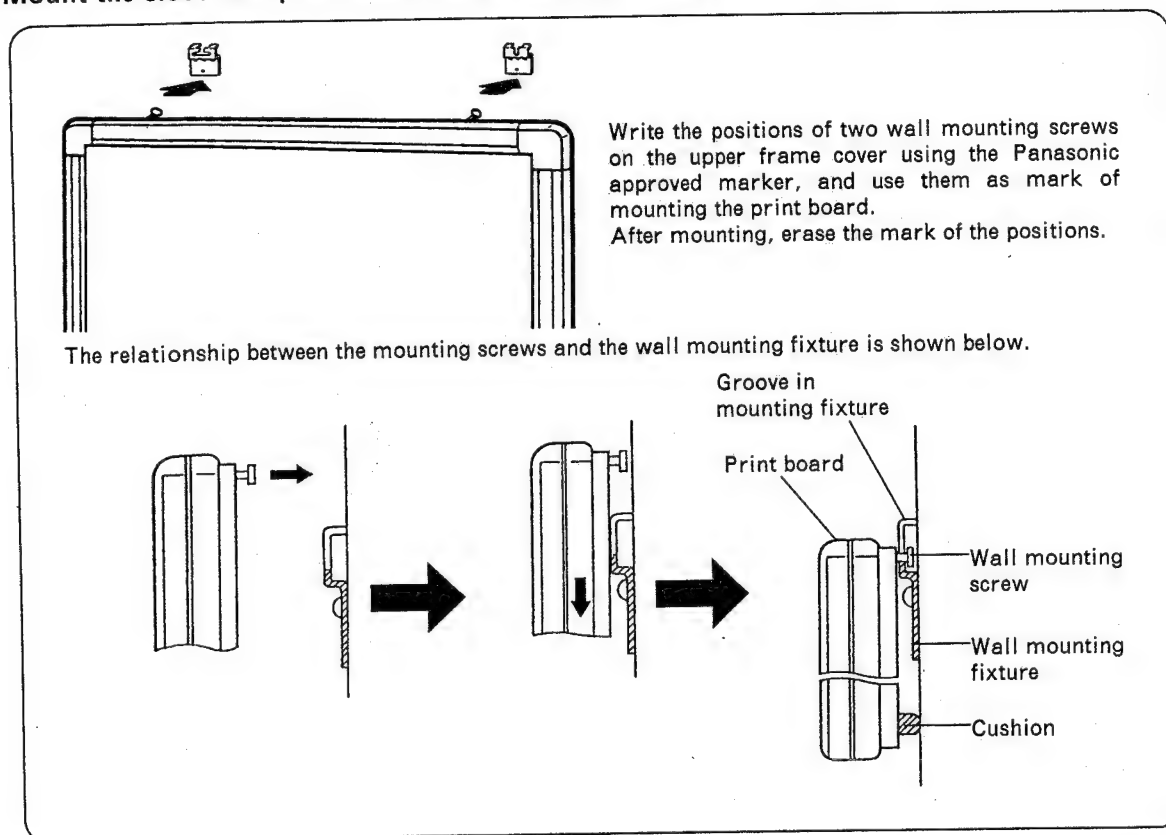


⑧ Install the wall mounting screws at the desired interval.



- The mounting screws may be installed at one of three intervals: 75 cm ($2' 5 17/32''$), 100 cm ($3' 33/8''$), 122 cm ($4' 1/32''$). Be sure to install the screws at the same mounting interval selected in part①.
- The wall mounting screws have been factory installed at the 100 cm ($3' 33/8''$) position.
- Tighten the mounting screws securely. Even if the factory-installed mounting interval is selected, be sure to retighten the screws before use.

⑨ Mount the electronic print board on the wall mounting fixtures.

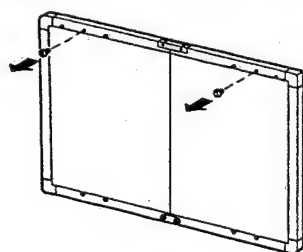


- When mounting the electronic print board, avoid banging it against the wall or otherwise causing impacts.
Impacts may cause damage to the internal fluorescent lamp or other parts.
- Set so that the cushion on the rear side of the board contacts the wall in a flat position.

■NOTE: After mounting the electronic print board, check the following points:

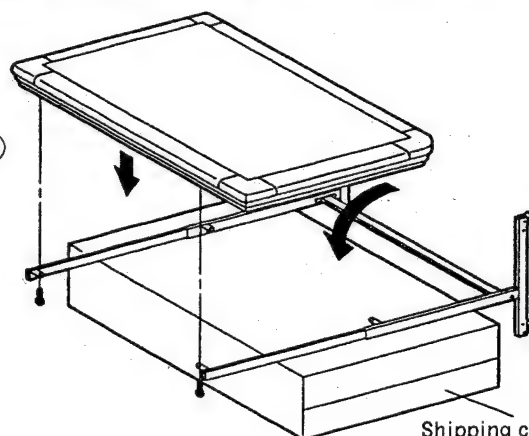
- Pull the electronic print board forward slightly and confirm that the mounting screws are hooked firmly inside the mounting fixtures.
 - Place weight gently on the electronic print board and confirm that the wall is strong enough to support the electronic print board.
- *To allow the electronic print board to be used in a stand setting, use of the optional stand (KX-B06C/06CS) is recommended.

⑩



Remove the two screws, then use them for safe keeping in step ⑬.

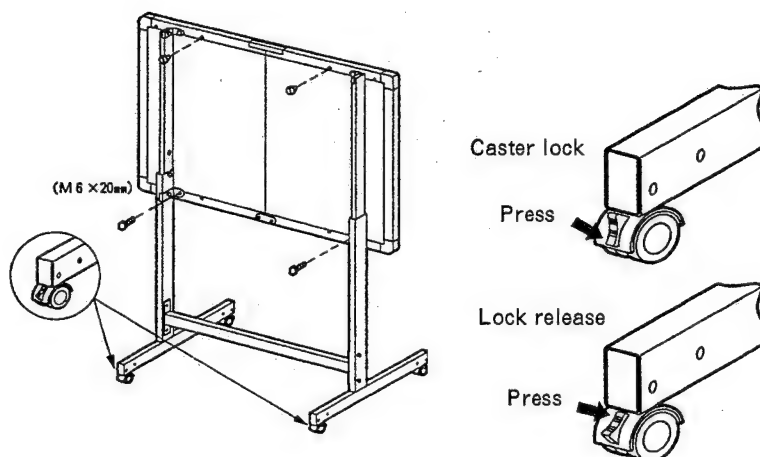
⑪



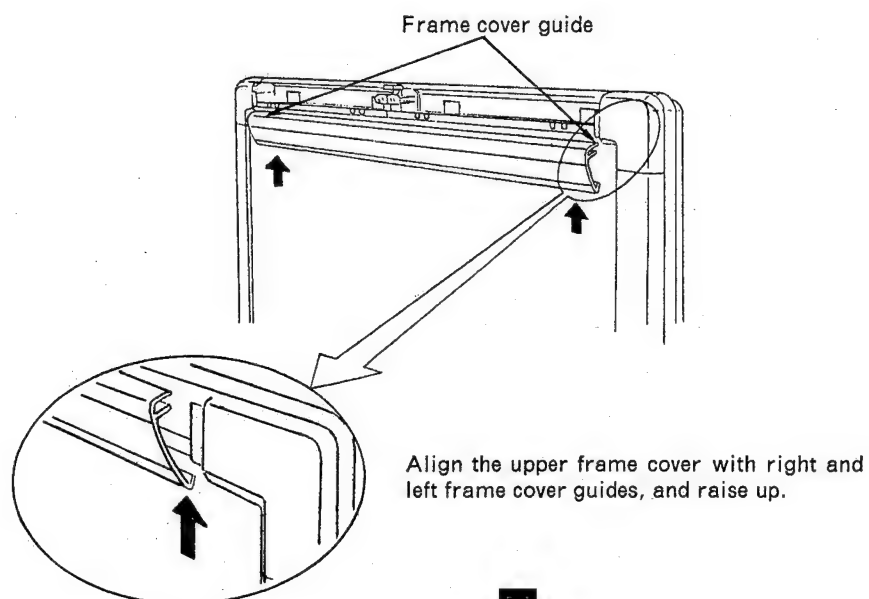
Shipping carton for
KX-B620/B520

KX-B620 Series
KX-B520 Series

⑫



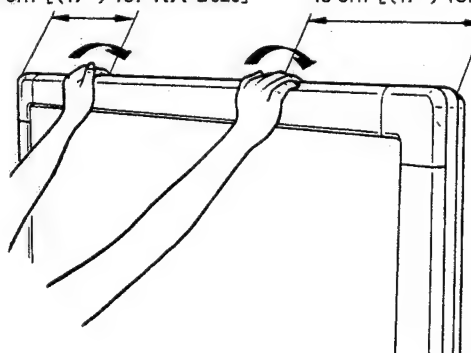
⑬



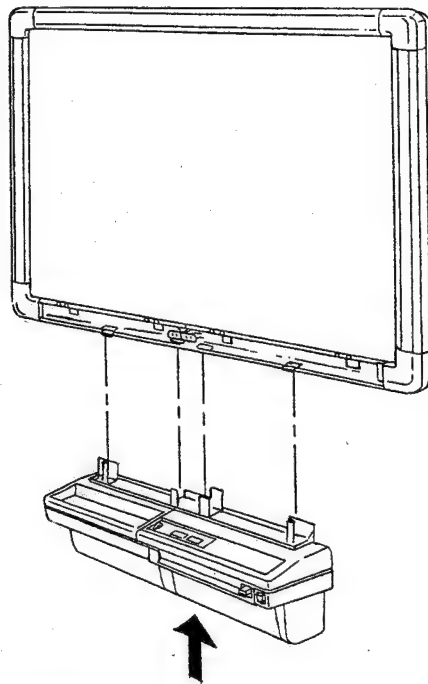
Place your hands at points about 52 cm [(20.5") for KX-B620] or 43 cm [(17") for KX-B520] from the right and left ends, and raise the upper cover, pressing in the direction of the arrows until the cover clicks into place.

52 cm [(20.5") for KX-B620]
 43 cm [(17") for KX-B520]

52 cm [(20.5") for KX-B620]
 43 cm [(17") for KX-B520]



14

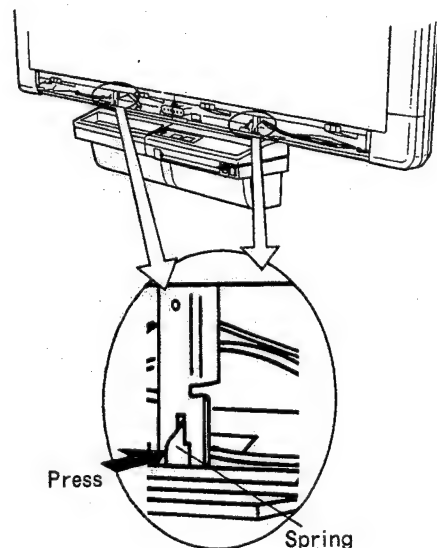
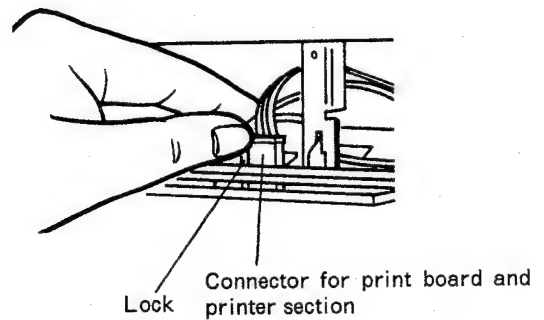


Lift up the printer section and press into the board until it clicks into place.

■ To disassemble the electronic print board:

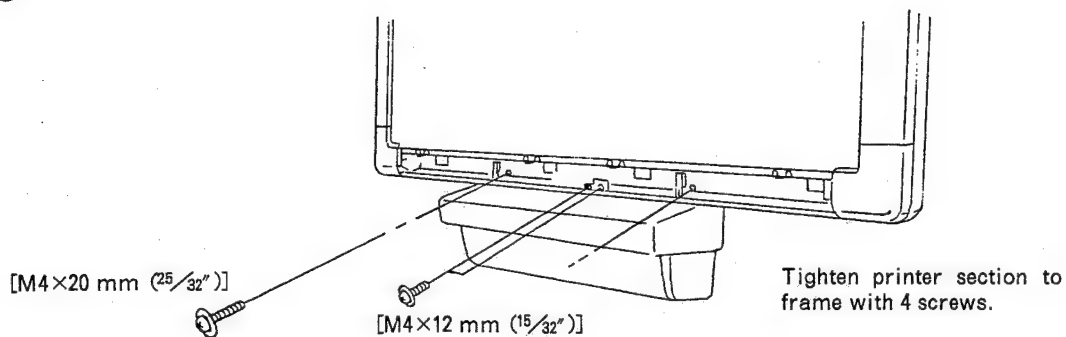
Reverse the previous steps (from step 12 to step 1).

- To disconnect the connector from the electronic print board, grasp the lock of the connector as shown at the right, then pull out.
- To disconnect the printer section from the electronic print board, press two springs simultaneously on the right and left mounting fixtures for the printer section as shown at the right while lifting up the printer section.
- After assembly, moisten a clean soft cloth with water, wring well, and wipe the film surface gently.

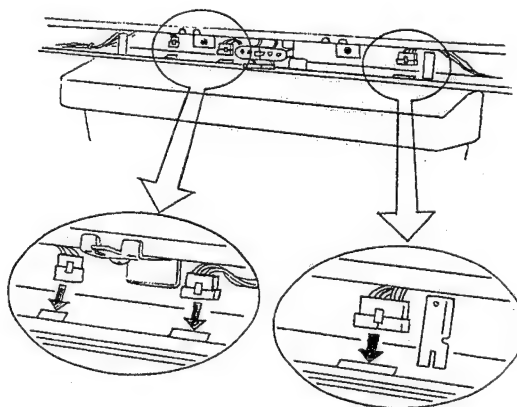


KX-B620 Series
KX-B520 Series

⑮

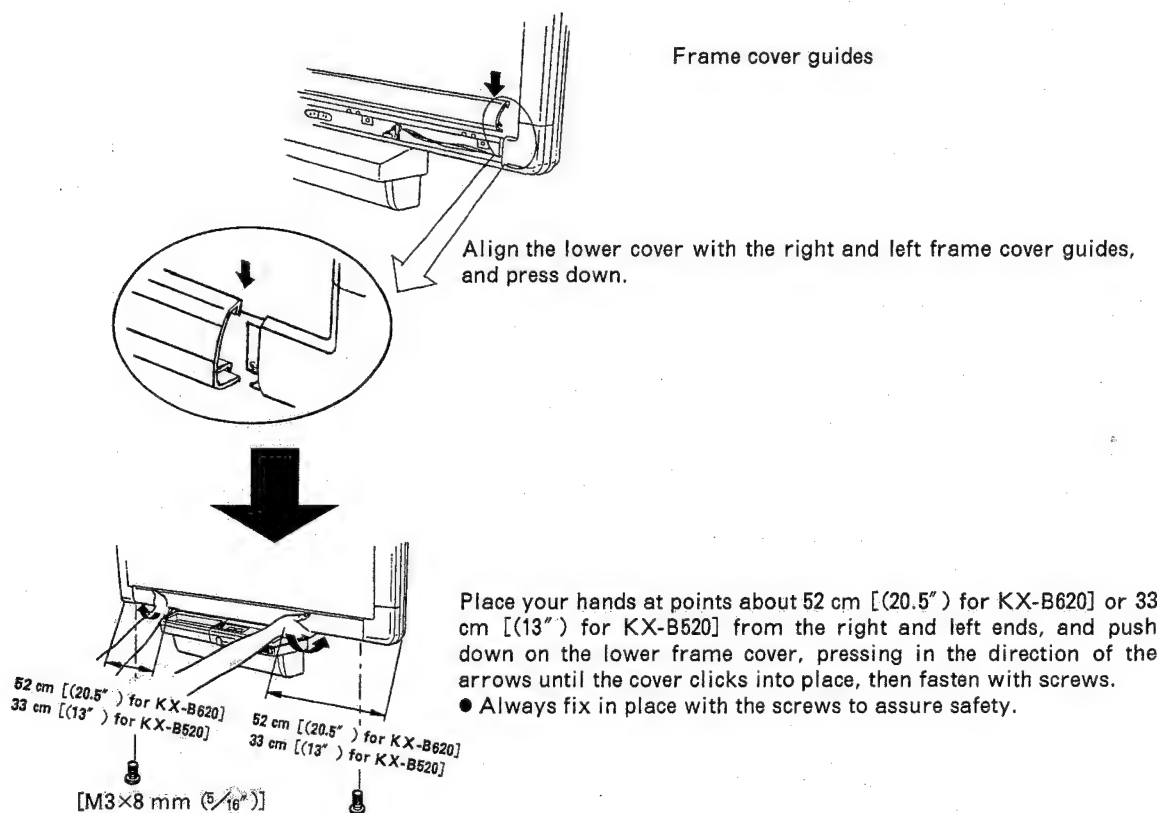


⑯



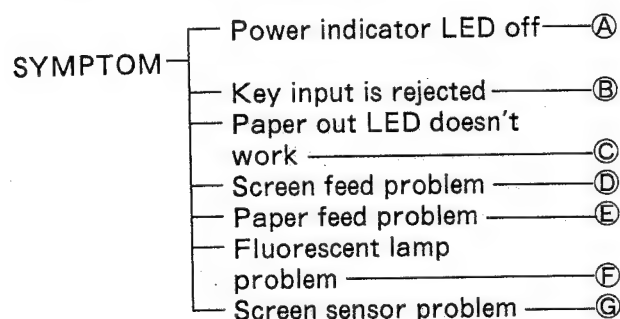
Connect the connectors from the print board securely to their receptacles.

⑰



10. TROUBLESHOOTING GUIDE

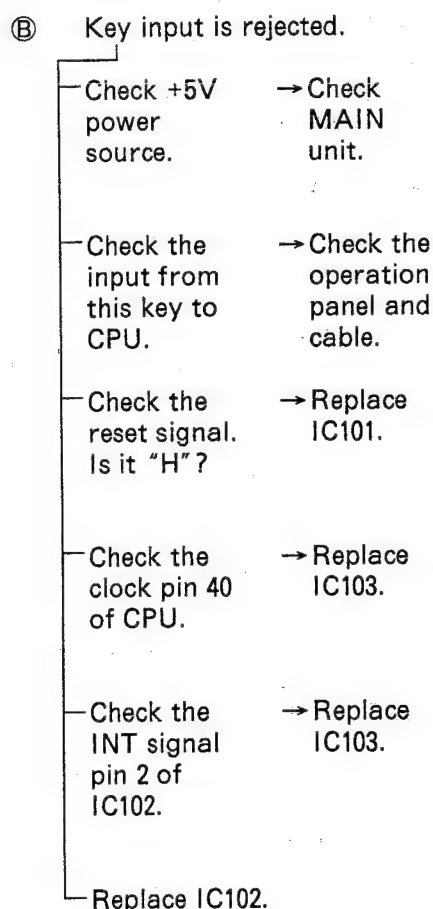
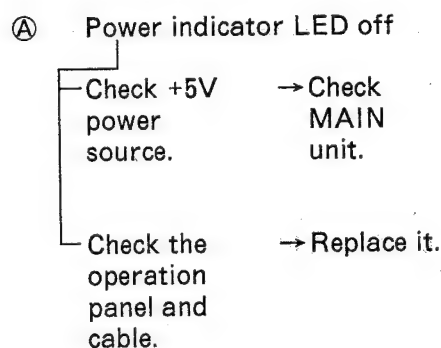
10-1. FAULTY FUNCTION



Check from the first symptom in alphabetical order.

- ① Power indicator LED off
Check +5V power source first.
It will indicate whether the trouble is in the MAIN unit or another area.
- ② Key input is rejected.
In this case also, check +5V power source first.
Next the control and operation boards must be checked.
- ③ Paper out LED doesn't work.
If power indicator is on and then paper is out, this LED must be on.
If not, the control board must be checked.
One of check points is the power source for IC106.
- ④ Screen feed problem
Mechanical problem must be checked first.
Is the installed condition of the motor and gear correct?
Next check the inputs and the outputs of motor driver IC104.
- ⑤ Paper feed problem
Same as ④ except motor driver IC105.
- ⑥ Fluorescent lamp problem
Input signals LAMPON, LAMPPRE of IC106 and +5V power source must be checked.
If it's OK, LAMP DRIVE CIRCUIT is perhaps damaged.

- ⑦ Screen sensor problem
First check the screen condition.
If it is loose, the screen sensor sometimes can't sense the screen home position.
If the screen is scrolling without stopping, check the position of tension spring screws located the left side of the panel.
Next check the screen home position sensor board.



KX-B620 Series KX-B520 Series

© Paper out LED doesn't work.

- Check the input pin 30 of CPU: (IC102) It is "H" when paper is out. → Check the micro switch installed condition. → Replace the micro switch.
- Check the ENDLED signal pin 3 of IC106. Is it "L"? → Replace IC102.
- Check the output pin 4 of IC106. Is it "L"? → Replace IC106.
- Check the operation panel and cable.

④ Screen feed problem

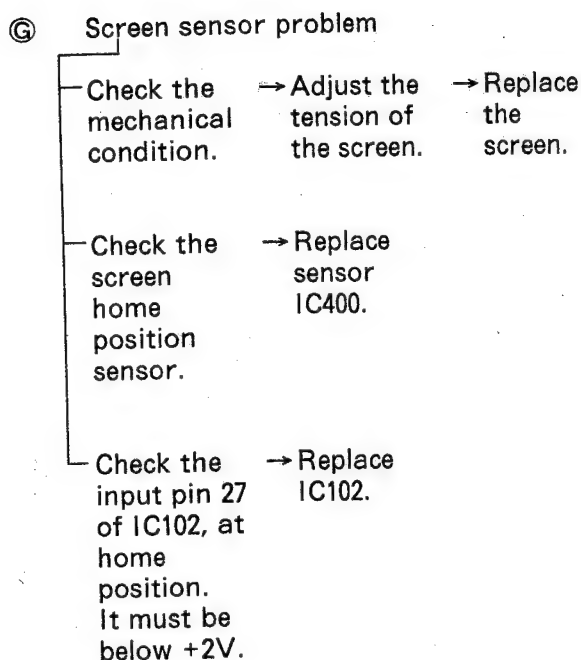
- Check the mechanical condition: → reassemble
- Check the input pins 1, 5, 8, 12 of IC104. → Replace IC102.
- Check the +24V cable. → Replace it.
- Check the +24V power source pins 3, 10 of IC104. → Check ZD100, ZD101. → Replace them.
- Check the output pins 2, 4, 9, 11 of IC104. → Replace IC104.
- Replace the motor.

⑤ Paper feed problem

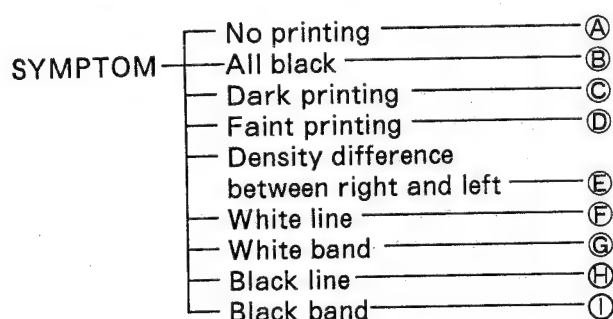
- Check the mechanical condition. → reassemble
- Check the input pins 1, 5, 8, 12 of IC105. → Replace IC102.
- Check the +24V power source pins 3, 10 of IC105. → Check ZD102, ZD103. → Replace them.
- Check the output pins 2, 4, 9, 11 of IC105. → Replace IC105.
- Replace the motor.

⑥ Fluorescent lamp problem

- Check the input pins 5, 9 of IC106. → Replace IC102.
- Check the +24V power source. → Check the MAIN unit.
- Check the output pins 6, 8 of IC106. → Replace IC106.
- Check the LAMP DRIVE CIRCUIT.
- Replace the LAMP.



10-2. FAULTY COPY



First check the mechanical condition.
Next the thermal head signals and power sources must be checked, it will indicate whether the thermal head is faulty or not.
If all the above checks are good, the thermal head is faulty.
If not, check the CCD board and control board.

- Ⓐ No printing
The thermal head signals must be checked.
If they are proper, the thermal head is faulty.
- Ⓑ All black
It is very rare that the thermal head is faulty.
Perhaps the CCD board or the control board is bad.

- Ⓒ Dark printing
Check the following.
- Faulty optical axis
 - Lack of light of the fluorescent lamp
 - Faulty CCD board
 - Faulty control board
 - Faulty mechanical condition of the screen
 - If a chart is attached, attach it again properly.

- Ⓓ Faint Printing
Check the following.
- Poor contact between the thermal head and the platen
 - Dirty surface on blank area of the screen
 - Dirty surface of the mirror
 - Dirty surface of the lens
 - Dirty surface of the CCD
 - Dirty surface of the thermal head
 - Faulty optical adjustment
 - Faulty CCD board
 - Faulty control board

- Ⓔ Density difference between right and left
- Poor contact between the thermal head and the platen
 - Faulty optical adjustment

- Ⓕ White line
- Faulty thermal head
 - Dirty surface of the mirror
 - Dirty surface of the lens
 - Dirty surface of the CCD
 - Dirty surface on blank area of the screen

- Ⓖ White band
- Strobe pulses must be checked first.
 - Faulty thermal head

- Ⓗ Black line
- Dirty surface of the mirror
 - Faulty optical adjustment

- ① Black band
- Faulty optical adjustment
 - Faulty thermal head

KX-B620 Series
KX-B520 Series

Ⓐ No printing

- Check the mechanical condition of the printer. → Close the printer correctly.
- Check the +24V CN17 pin 1-4. → Check the cable.
- Check the video signal TP2 in the CCD board. → Check the +12V power source and clock signals to CCD IC201. → Replace IC201.
- Check the analog circuit in the control board (IC109 pin 15).
- Check the HDATA LATCH CLKHD signals in the control board. → Check IC103, IC109. → Replace.
- Faulty thermal head → Replace it.

Ⓑ All black

- Check the video signal TP2 in the CCD board. → Check the clock signals to CCD IC201. → Replace IC201.
- Check the analog signal IC 109 pin 15 in the control board.
- Check the HDATA LATCH CLKHD signals in the control board. → Check IC103, IC109. → Replace.
- Faulty thermal head → Replace it.

Ⓒ Dark printing

- Check the optical axis adjustment. → Adjust.
- Check the screen tension. → Replace.
- Check the fluorescent lamp. → Replace.
- Check the CCD board.
- Check the control board.

Ⓓ Faint printing

- Check the printer mechanical condition. → Close the printer correctly.
- Check the white blank area of the screen. → Clean this area.
- Check the surface of the lens. → Clean.
- Check the surface of the CCD. → Clean.
- Check the surface of the thermal head. → Clean.
- Check the optical axis. → Adjust it correctly.
- Check the video signal in the CCD board. → Replace.
- Check the control board.

Ⓔ Density difference between right and left

- Check the printer mechanical condition. → Close the printer correctly.
- Check the optical axis. → Adjust it correctly.

Ⓔ White line

- Check the surface of the lens. → Clean.
- Check the surface of the CCD. → Clean.
- Faulty thermal head. → Replace.

Ⓒ White band

- Check the strobe signals. → Check the control board.
- Check the LATCH signal. → Check the control board.
- Faulty thermal head. → Replace.

Ⓕ Black line

- Check the surface of the mirror. → Clean.
- Check the optical axis. → Adjust.

① Black band

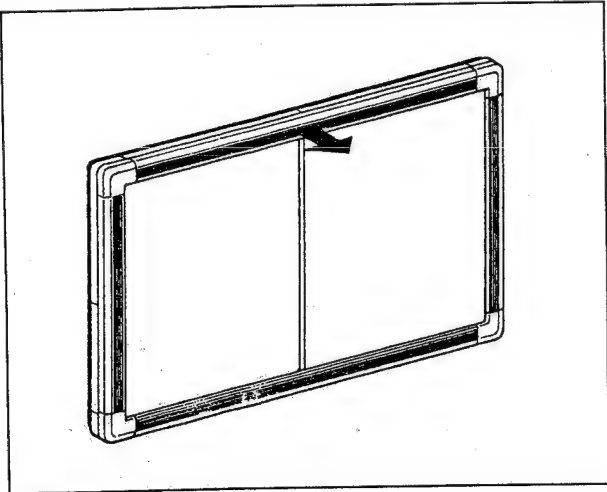
- Check the optical axis. → Adjust.
- Faulty thermal head. → Replace.



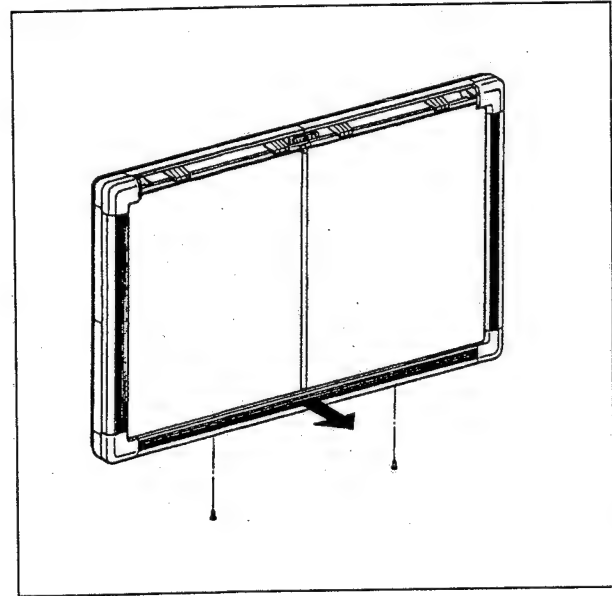
11. DISASSEMBLY AND EXCHANGE

| Exchange Parts | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ⑮ | ⑯ |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● Fluorescent lamp | ○ | ○ | ○ | | | | ● | | | | | | | | | |
| ● Screen | ○ | ○ | ○ | ○ | | ● | | | | | | | | | | |
| ● CCD Board | ○ | ○ | ○ | ○ | ○ | | ● | | | | | | | | | |
| ● Screen feed motor | ○ | ○ | ○ | ○ | ● | | | | | | | | | | | |
| ● Control Board | | ○ | | | | | | | ○ | ○ | ○ | ● | | | | |
| ● Thermal head | | ○ | | | | | | | ○ | ○ | ○ | ○ | ● | | | |
| ● Power Supply Unit (PSU) | | ○ | | | | | | | ○ | | | | | ○ | ● | |
| ● Paper feed motor | | ○ | | | | | | | ○ | ○ | | | | | | ● |

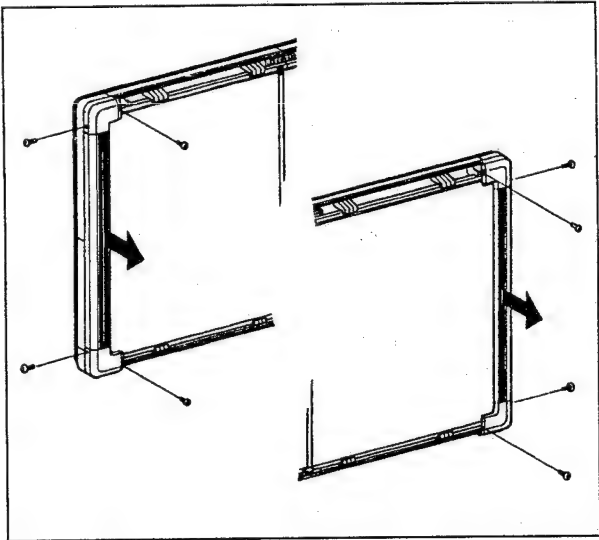
① Remove the top of the Frame Cover B.



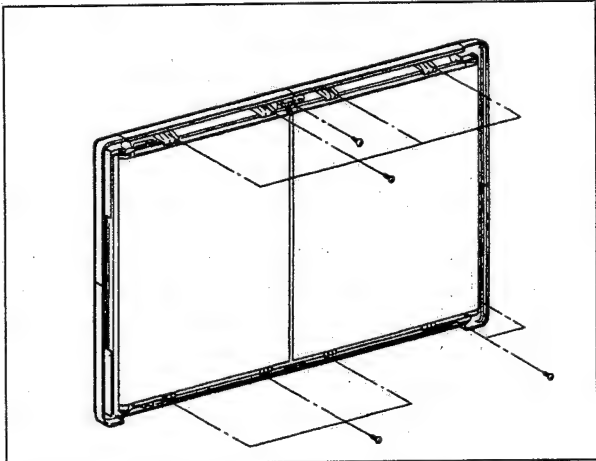
② Remove 2 screws on the bottom of the Frame Cover C.



③ Remove 8 screws on the lower left and upper left of the Frame Cover A, and remove the left part of the Frame Cover A.



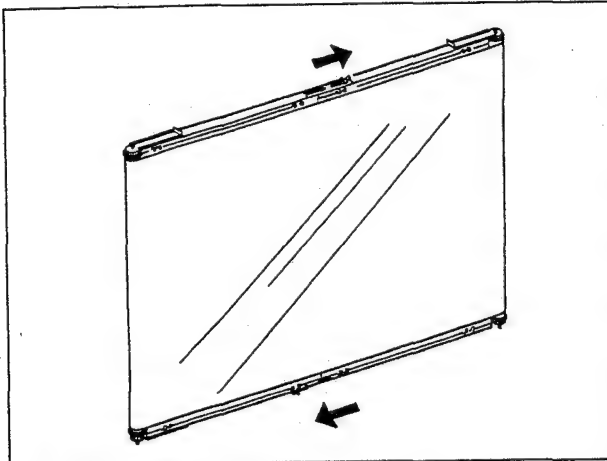
④ Remove 2 screws for fixing the screen feed motor bracket, 1 screw for fixing the core and 7 screws to remove the middle plate.



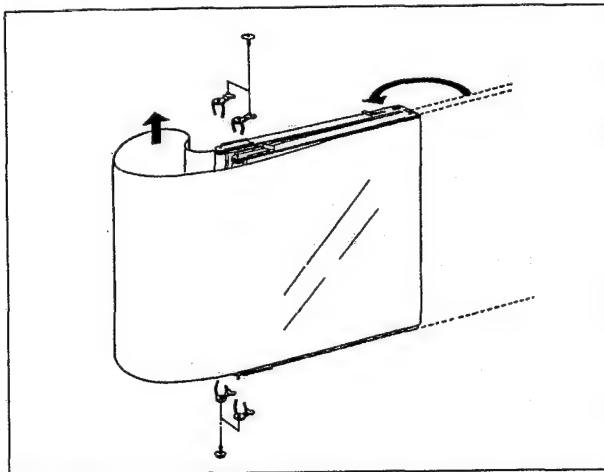
* The screen drive motor connector must be disconnected before removing the middle plate assembly.

KX-B620 Series
KX-B520 Series

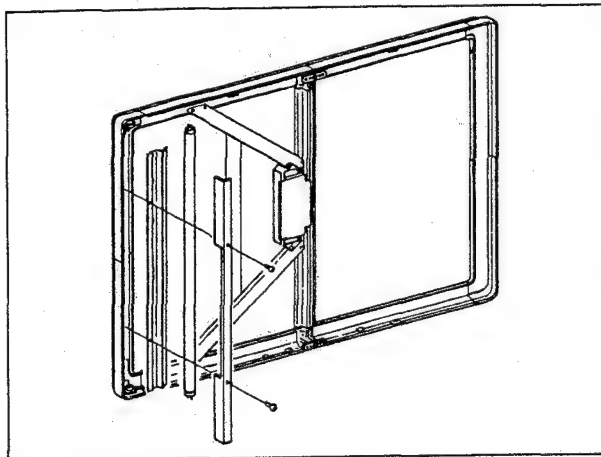
- ⑤ Then loosen 2 wing bolts, slide the upper and lower slide brackets to the direction of the allows separately.



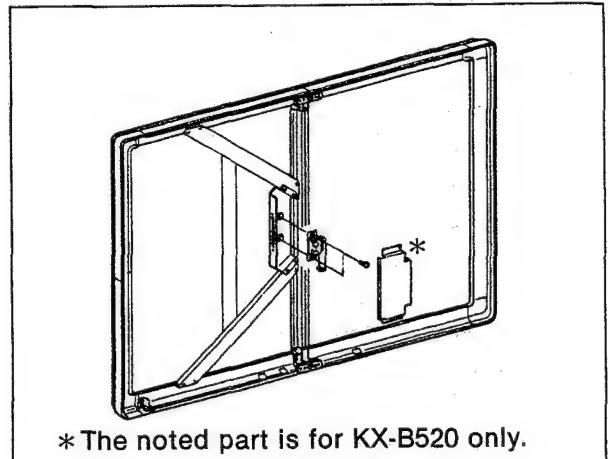
- ⑥ Remove 4 screws which secure each screen holder, and remove holders. Then, turn the middle plate to the direction of the allow to loosen the screen. Replace the screen. Refer to the separate sheet for tension adjustment of the screen.



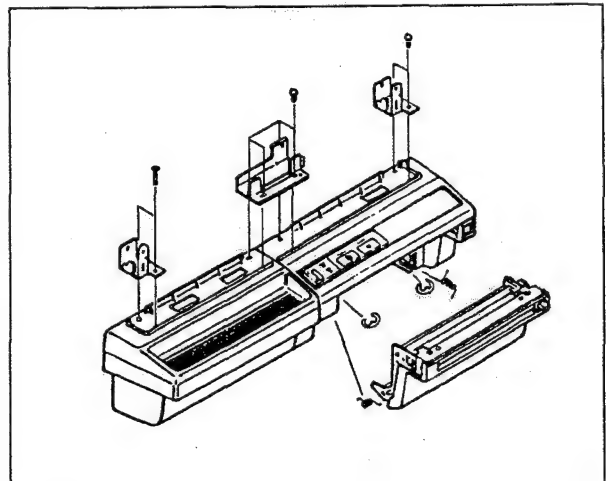
- ⑦ Remove 2 screws, and remove the Bracket L Frame plate and the Bracket lamp shield. Replace the fluorescent lamp.



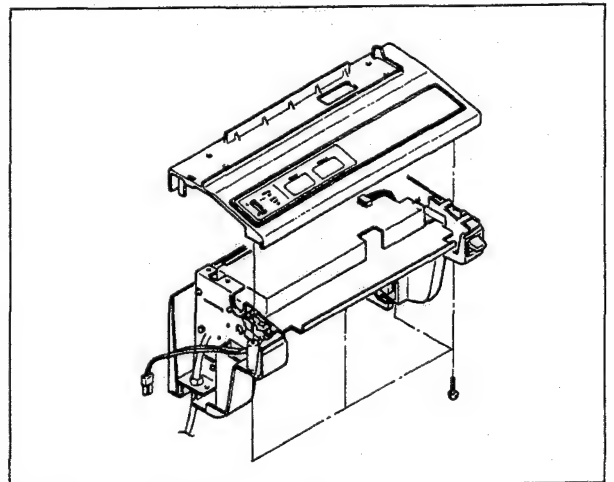
- ⑧ Remove 2 screws that fix the CCD unit and replace it. Refer to the separate sheet for adjustment.



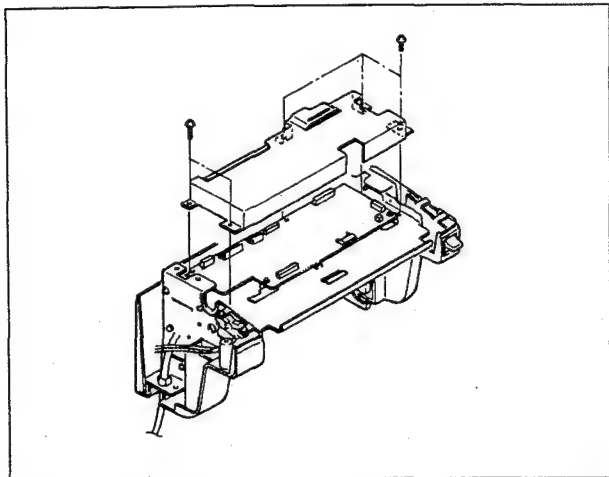
- ⑨ Release 2 locking portions and remove the printer section, remove 8 screws that fix the printer section. Then open the printer door and remove 2 E-rings and 2 springs to remove the opening/closing section.



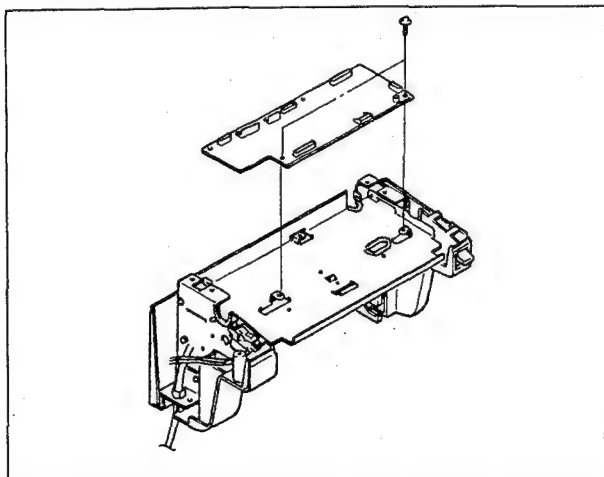
- ⑩ Remove 4 screws, disconnect the connector (LED to Control Board), and remove the Printer Cover Upper.



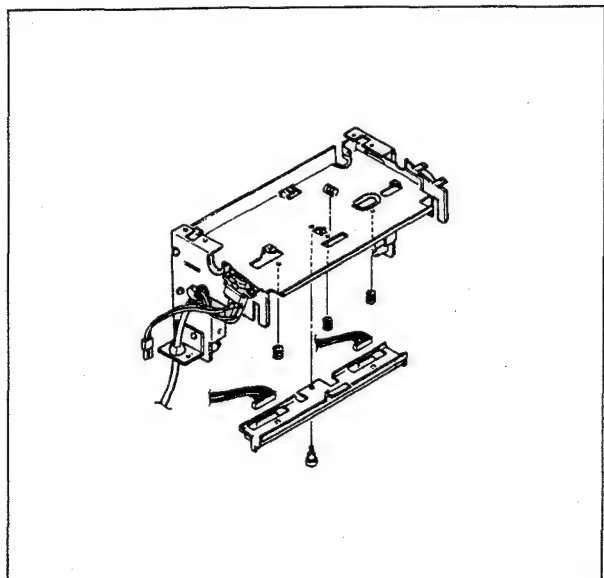
- ⑪ Remove 5 screws, disconnect the connector (Shield plate to Control Board), and remove the shield Cover Control Board.



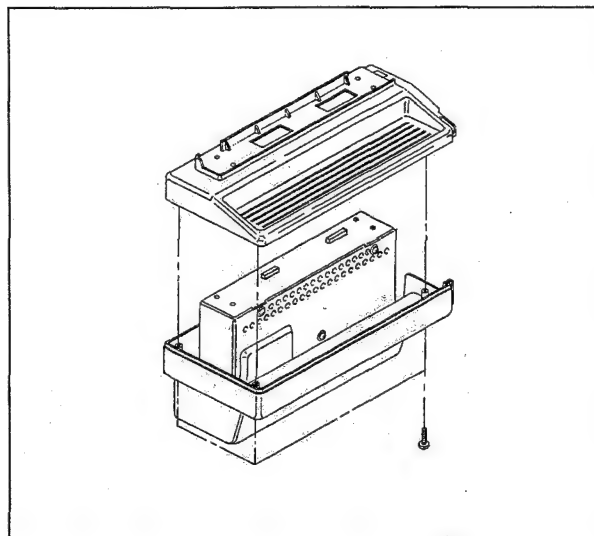
- ⑫ Disconnect the connector, remove 2 screws, and remove the Control Board for replacement.



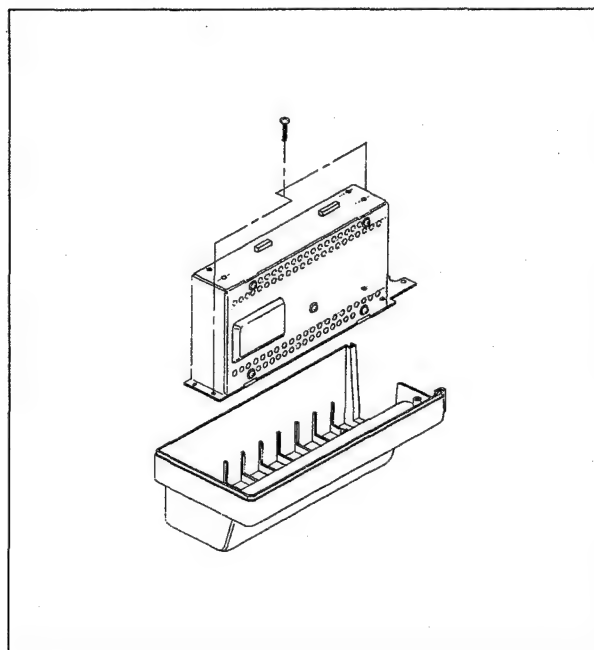
- ⑬ Remove the upper springs and 1 screw, and remove the thermal head.



- ⑭ Remove 3 screws and remove the Tray Upper.

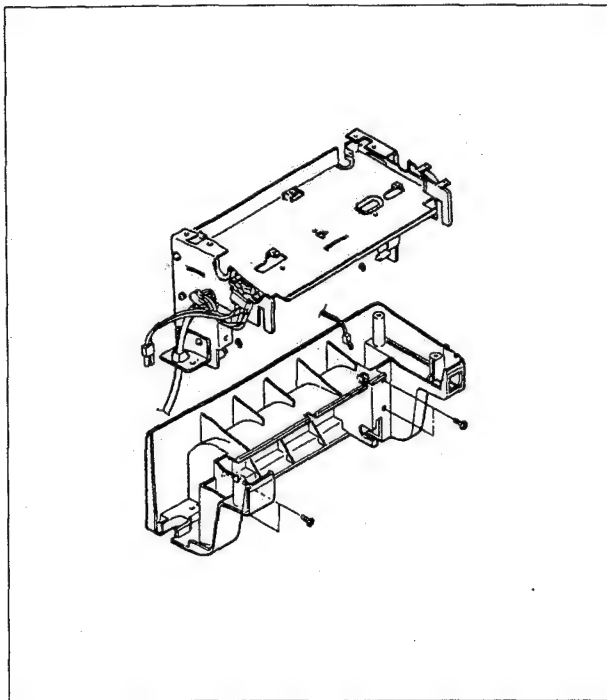


- ⑮ Disconnect the connector (AC to Main) and remove 2 screws, and replace the PSU.



KX-B620 Series
KX-B520 Series

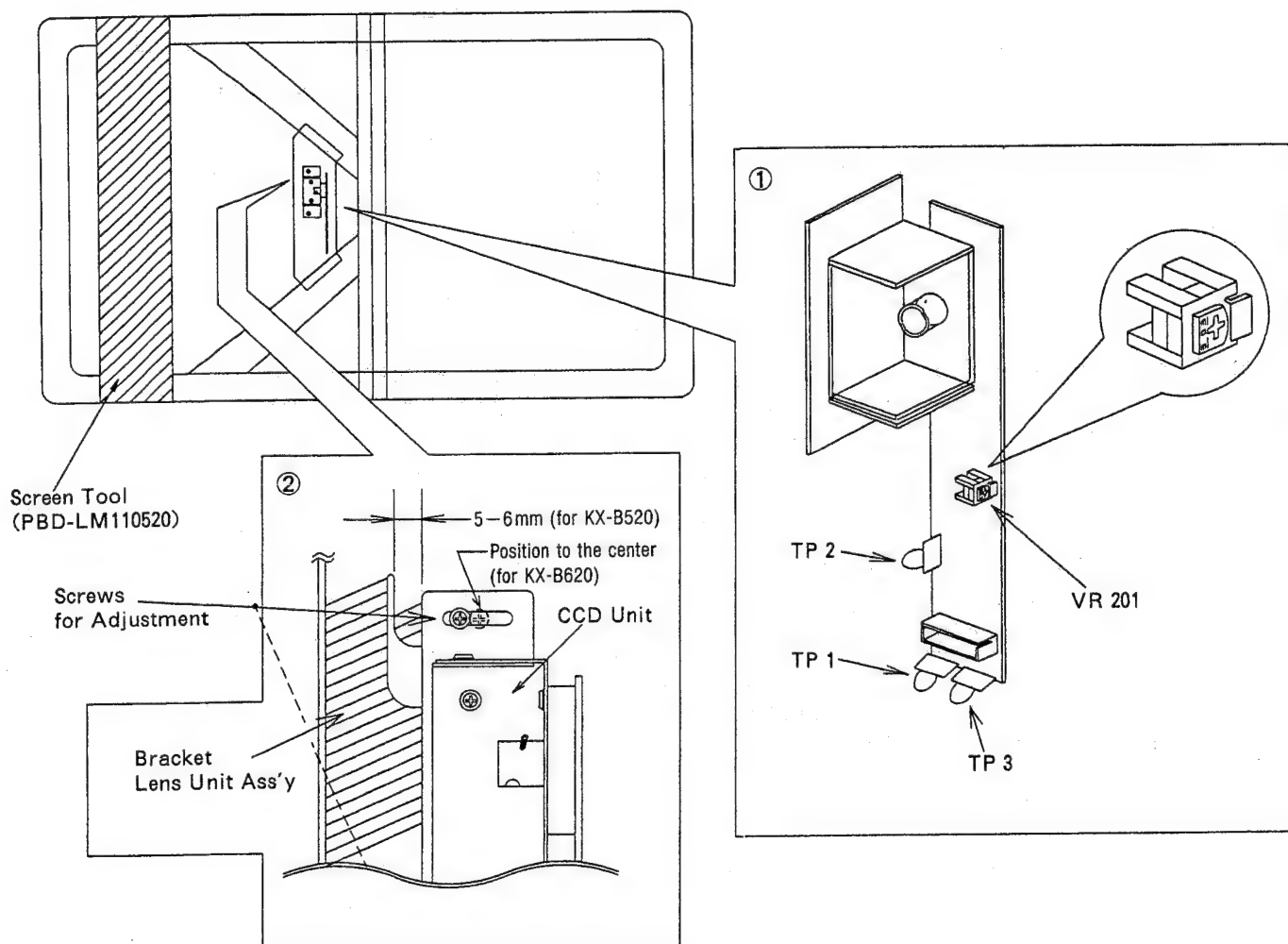
- ⑩ Remove 6 screws to remove the lower cover.
Replace the motor.



12. ADJUSTMENTS

CCD Adjustment Procedure

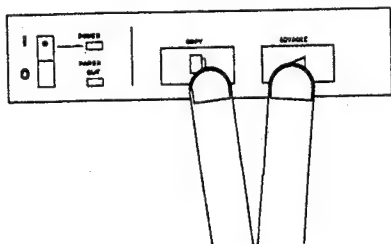
- ① Adjustment Tool set
 Remove all the parts necessary to gain access to the CCD unit (Use the "DISASSEMBLY AND EXCHANGE" steps ①—④ in section 11).
 Set the Screen Tool to the Print Board.



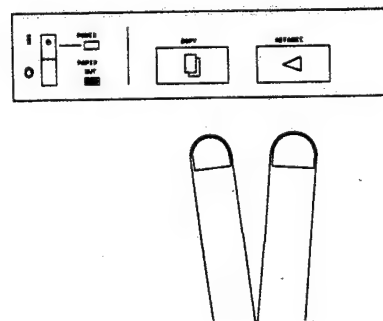
- ② Set the oscilloscope as follows (See ①) :
 CH 1 * * * TP 1 : DC Normal Mode 5V/DIV
 CH 2 * * * TP 2 : AC Inverted Mode 1V/DIV
 GND * * * TP3
 Time is 0.5 ms/DIV
- ③ Set VR201 as follows (See ①) :
 Adjust VR201 to about center position.
- ④ Set the CCD Unit as follows (See ②) :
 Set the Gap between the Bracket Lens Unit Ass'y and CCD Unit at 5-6 mm.

KX-B620 Series KX-B520 Series

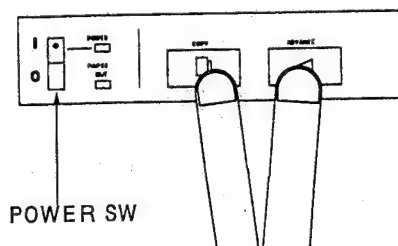
- ⑤ Press both the "COPY" and "ADVANCE" Keys simultaneously and hold them.



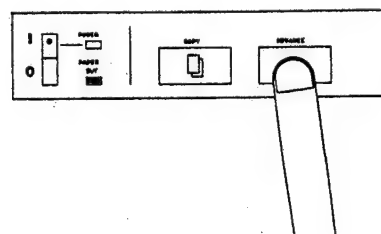
- ⑧ Remove both fingers.



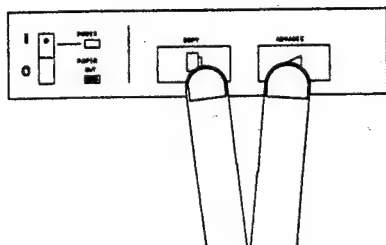
- ⑥ Turn on the POWER SW.



- ⑨ Press the "ADVANCE" Key (CCD Data Transfer Mode).



- ⑦ The "PAPER OUT" Indicator lights about 3 seconds later.



⑩ Horizontal Adjustment-1
 (The Screen Tool position is 5 lines read position.)

Loosen 2 screws (Fig. 1) and set the peak value of the waveform to a maximum using the Adjustment Tool. Then, tighten 2 screws alternately.

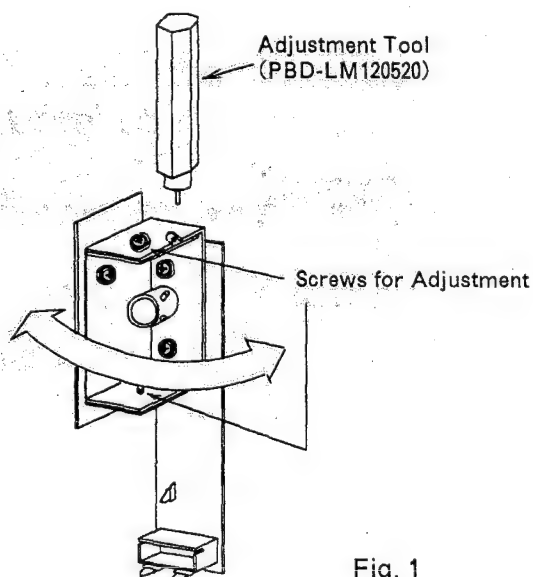
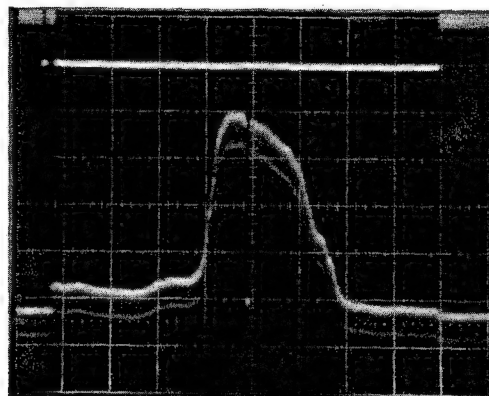


Fig. 1



⑪ Horizontal Adjustment-2
 (The Screen Tool position is 5 lines read position.)

Loosen 2 screws (Fig. 2) and adjust the waveform to conform with Fig. 2. Then, tighten 2 screws alternately. The point of this adjustment is the shoulder of the both side waveform.

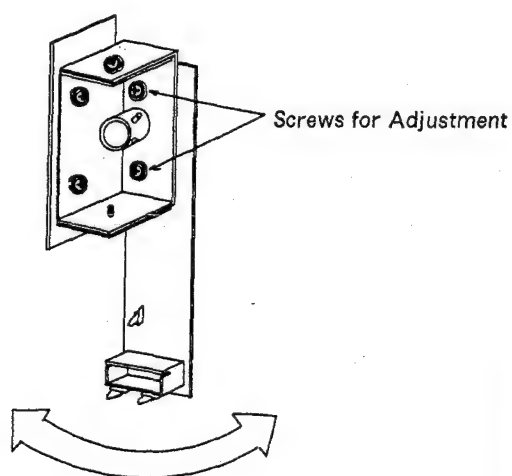
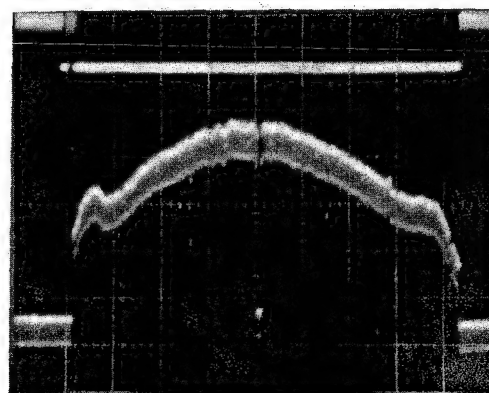


Fig. 2



KX-B620 Series
KX-B520 Series

- ⑫ Slope Adjustment
 (The Screen Tool position is 5 lines read position.)

Loosen 2 screws and adjust the waveform to flat (Fig. 3) using the Bracket Light Interceptor. Then, tighten 2 screws alternately.

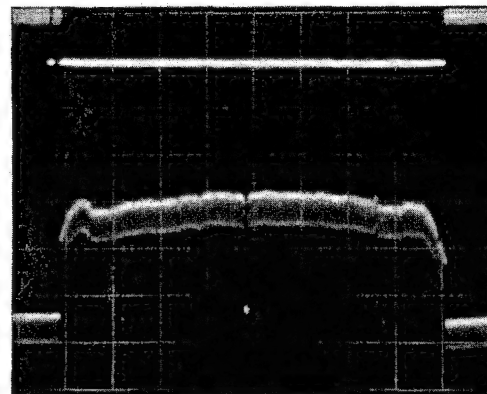
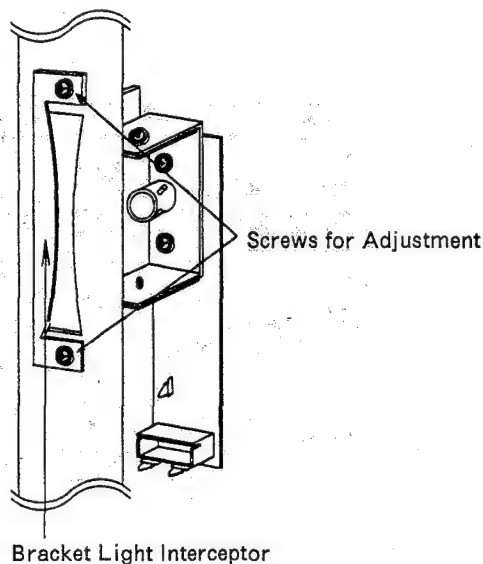


Fig. 3

- ⑬ Focus Adjustment
 (The Screen Tool position is 5 lines read position.)

Loosen the lens set screw and set the peak value of the second pulse V2 (Fig. 4) to a maximum using the Adjustment Tool.

Then, tighten the set screw. Put on a Lens Shield. The function of the Lens Shield is the cut of the useless light.

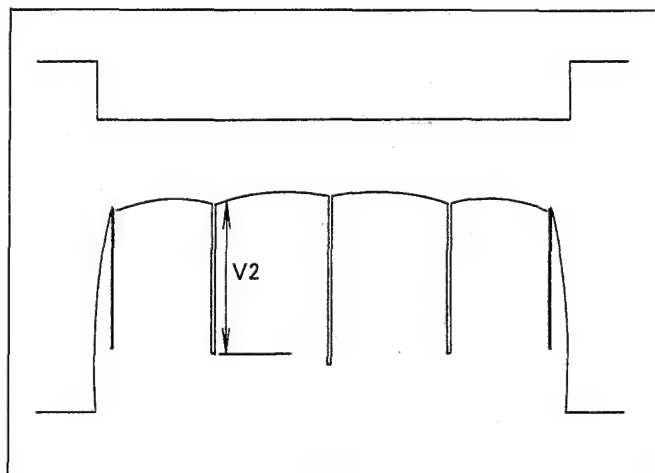
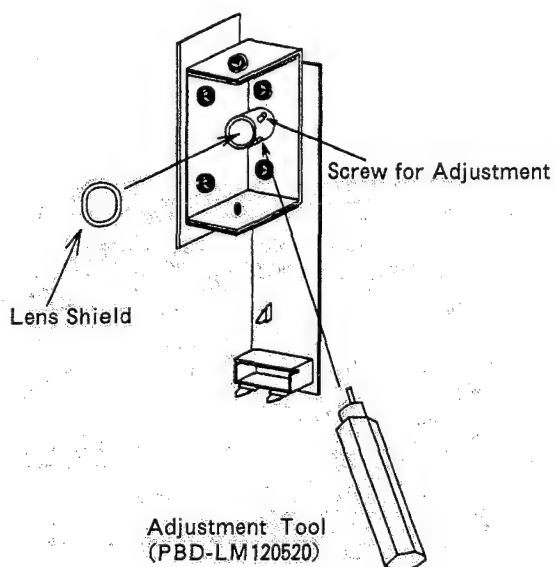


Fig. 4

- ⑭ Vertical Adjustment
(The Screen Tool position is 5 lines read position.)
(This adjustments time range is 50 μ s/DIV.)

Loosen 2 screws and adjust the reading width to conform with the waveform in Fig. 5.
Then, tighten 2 screws alternately.

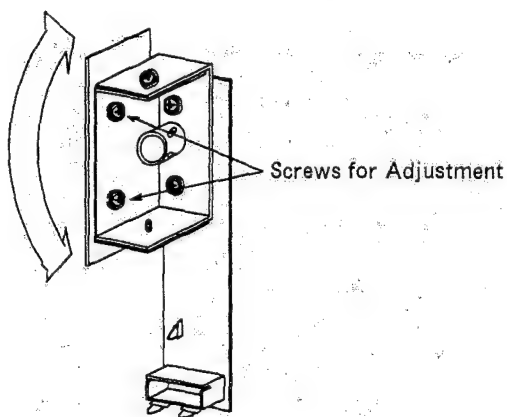
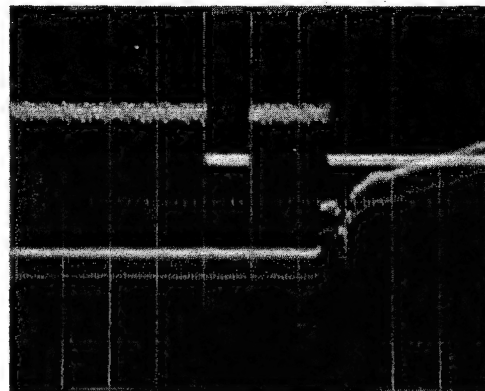


Fig. 5



If the Vertical Adjustment is impossible, loosen 2 screws and adjust the CCD unit to forward or backward (Fig. 6) .

Then, tighten 2 screws alternately.

Repeat "⑩ Horizontal Adjustment" to "⑭ Vertical Adjustment".

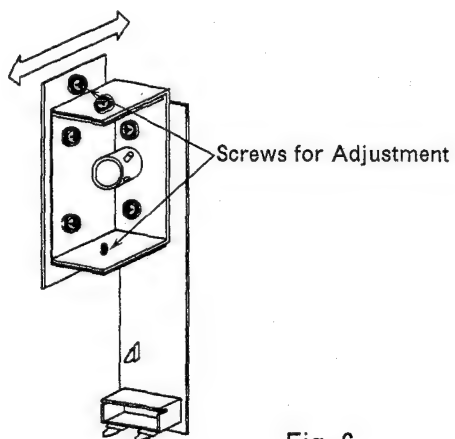


Fig. 6

- ⑮ Gain Adjustment
(The Screen Tool position is white area read position.)

Adjust VR201 to obtain the peak level of waveform (4.5V).

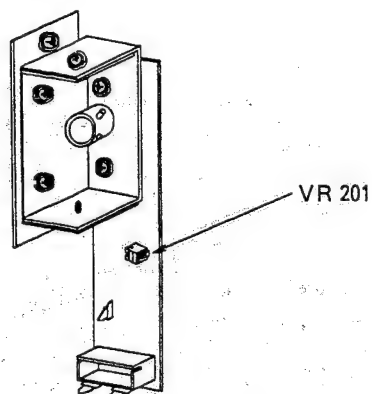


Fig. 7

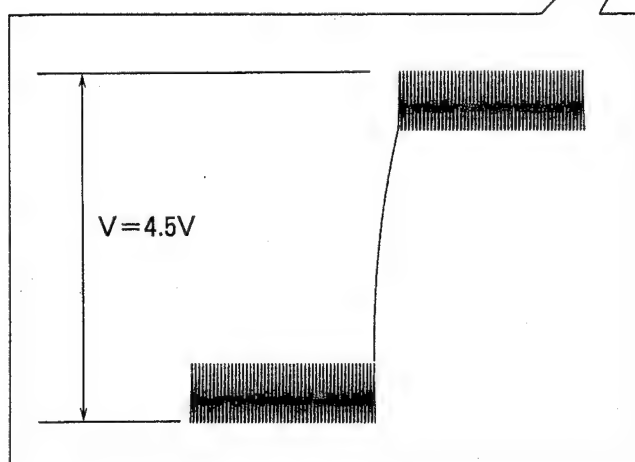
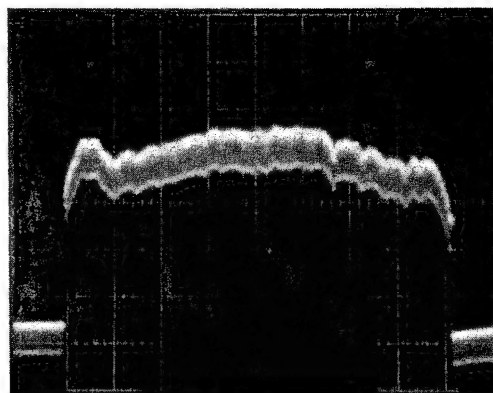


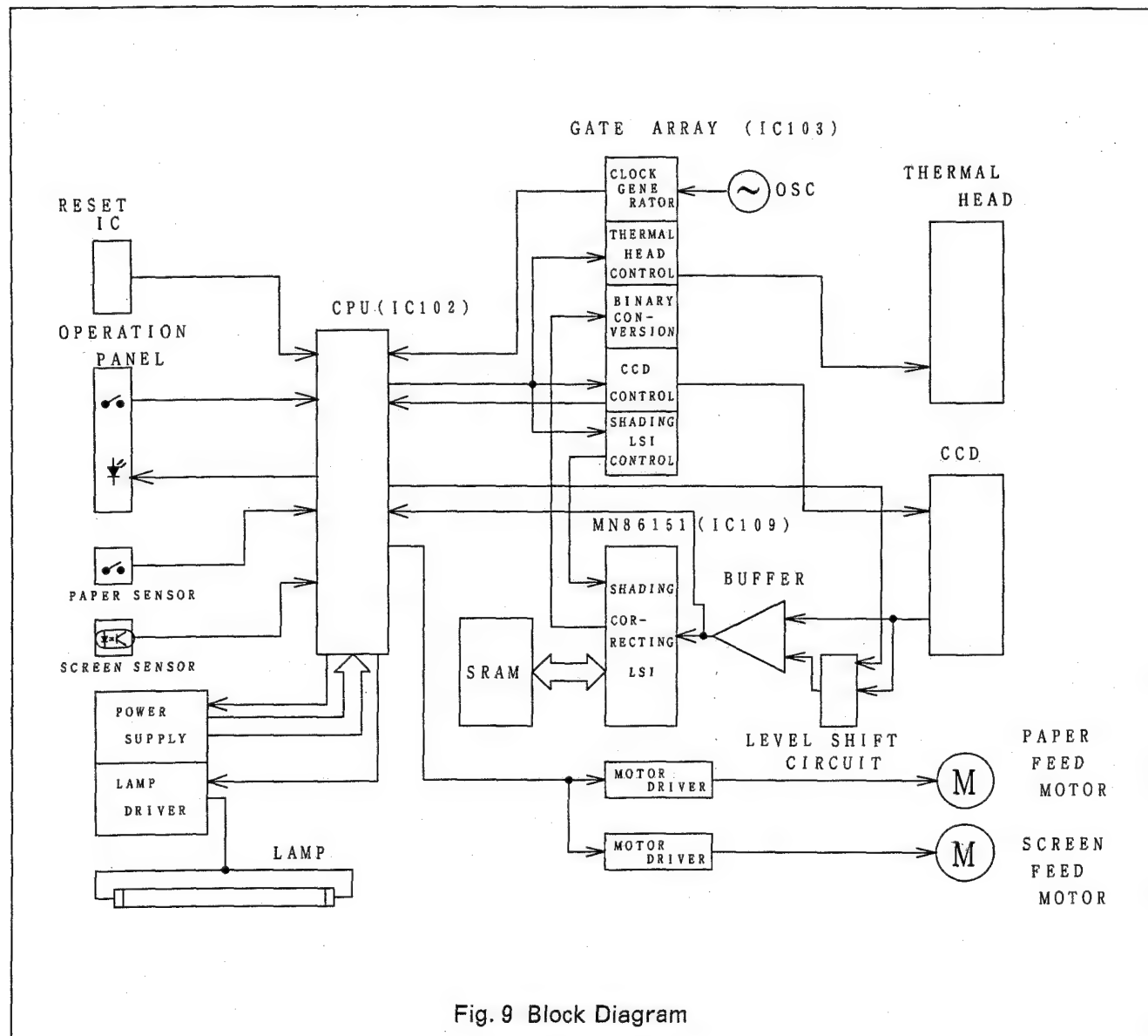
Fig. 8

13. CIRCUIT OPERATION

1. GENERAL BLOCK DIAGRAM AND FLOWCHART

The control section will be explained as shown in the block diagram.

- 1) CPU (IC102) makes the timing signals for control of other circuits, for example CCD, Thermal Head.
- 2) Gate Array (IC103) makes the signals for Thermal Head, CCD, Shading correcting and A/D convert LSI (IC109) from the signals of CPU.
- 3) LSI (IC109) compensates the shading distortion of the analog signal and converts it to the digital signal.
- 4) Thermal Head contains the heating elements for the dot matrix image printing.
- 5) CCD image sensor is a 1,024 bit linear image sensor, and executes reading the document on the screen.
- 6) Power Supply supplies +5V, +24V, +12V, -12V.
- 7) Lamp Driver drives the Lamp in a high frequency.
- 8) Motor Drivers drive the Screen Feed Motor and Paper Feed Motor.



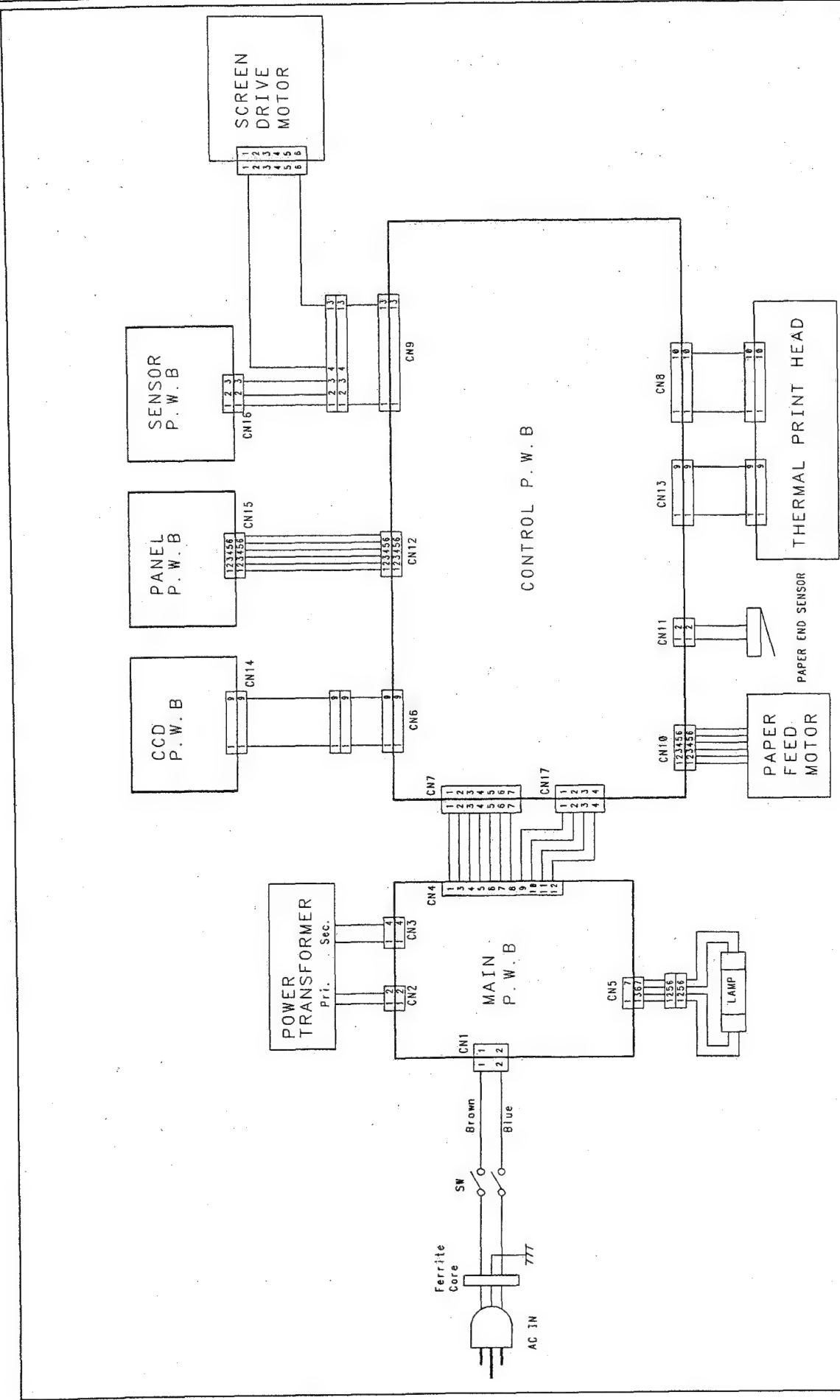
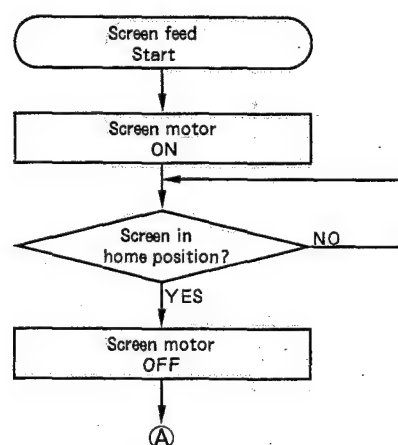
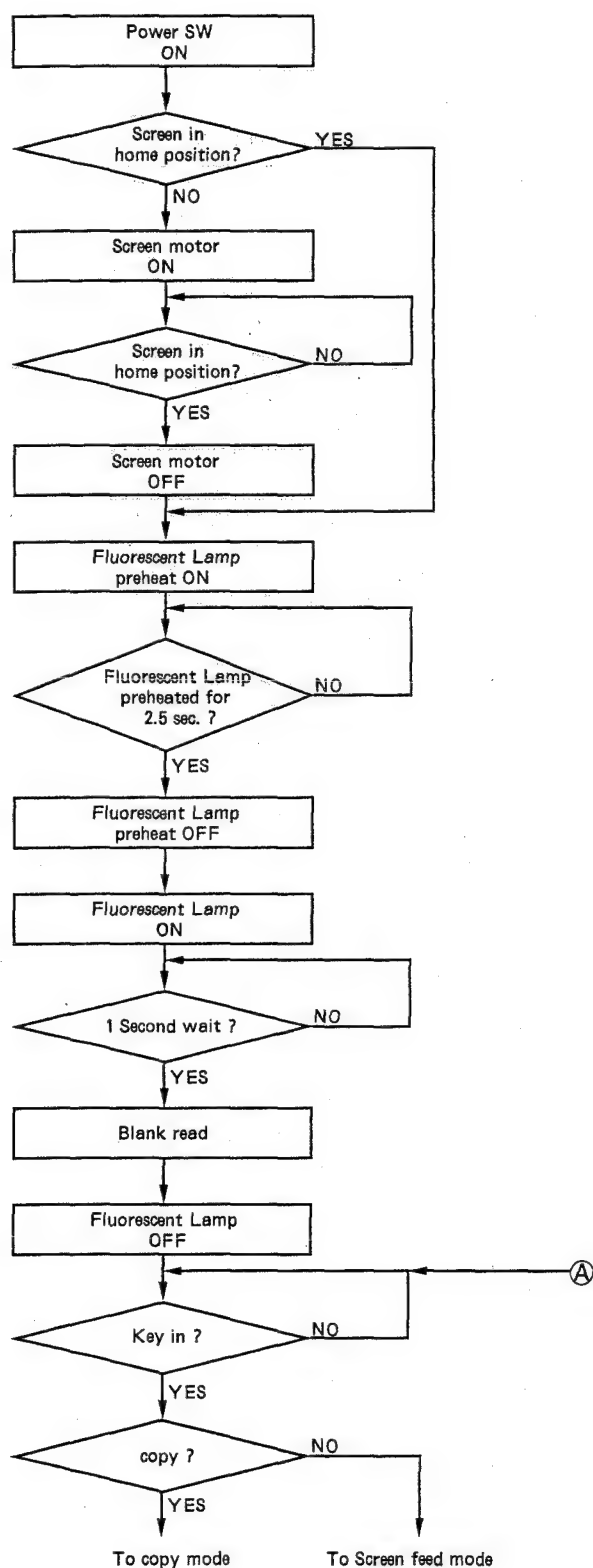
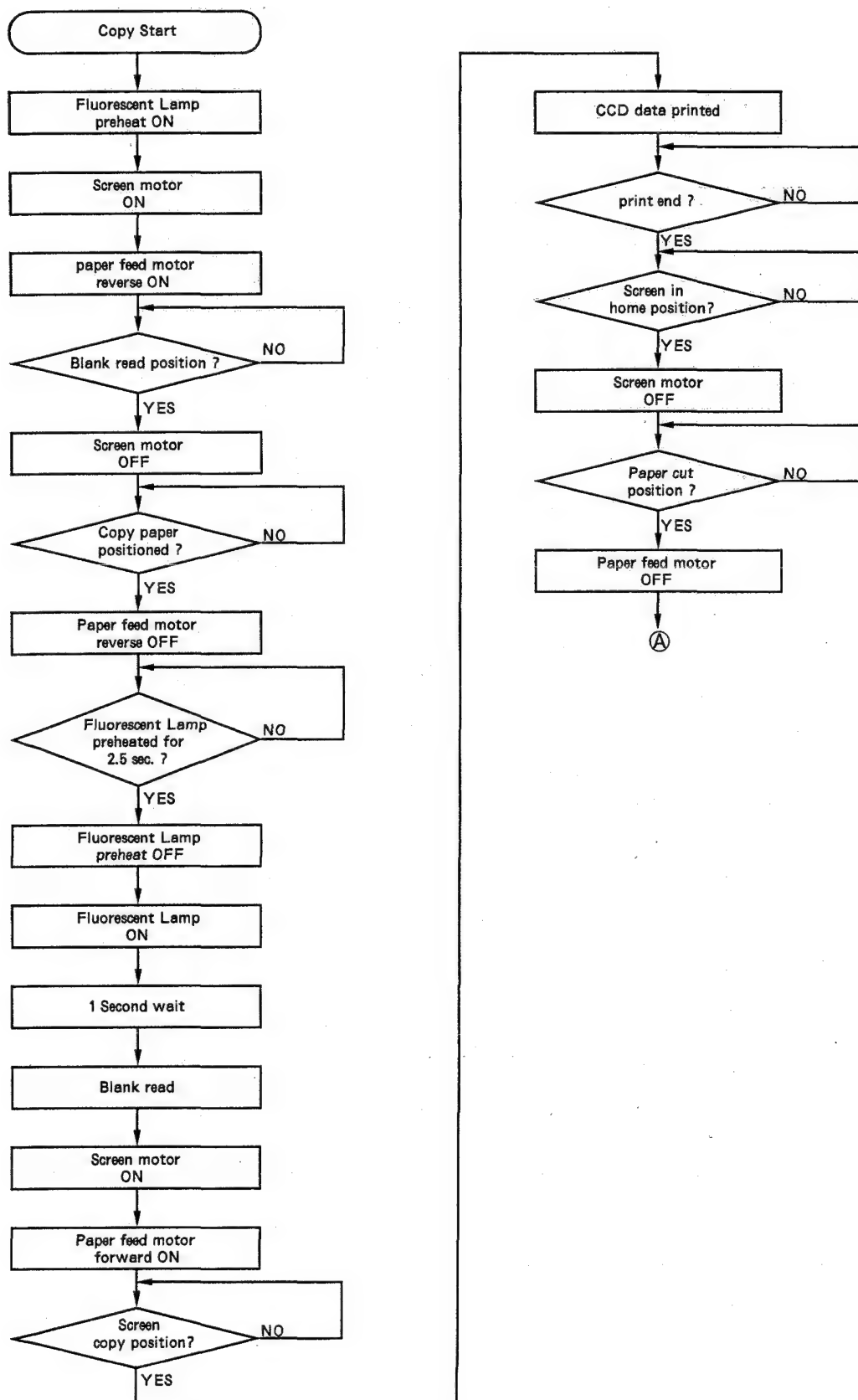


Fig. 10 Interconnection

Flowchart





2. CONTROL SECTION

2-1 CPU (IC102)

1) Specification

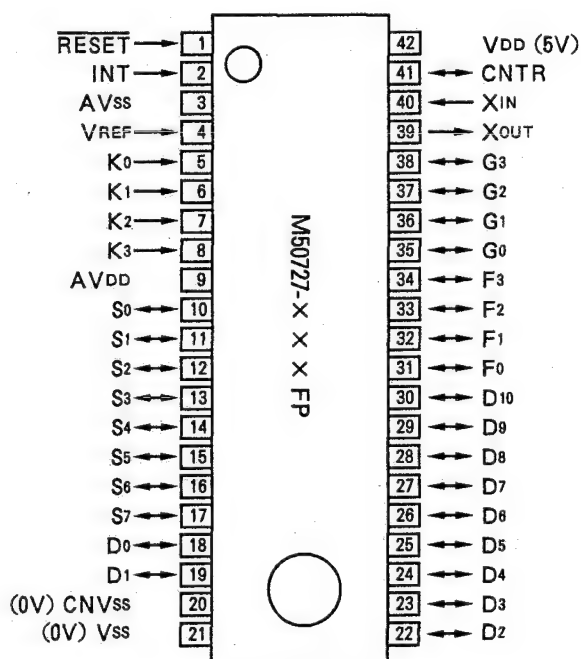
The KX-B620/B520 Series uses a single-chip 4 bit CMOS microcomputer.
Its specification is as follows.

- INSTRUCTION EXECUTION
TIME1 μ s min
- MEMORY ROM.....4,096 word \times 9 bit
RAM256 word \times 4 bit
- TIMER TIMER19 bit timer
TIMER2 ...8 bit timer/event counter
TIMER3 ...8 bit timer/event counter
TIMER48 bit timer
- INTERRUPT SIGNALS4 (external, timer, serial I/O timer2)
- ANALOG INPUT (Port K)4
- I/O PORT (Port D, F, G, S)27
- TIMER I/O (CNTR)1
- SERIAL I/O8 bit \times 1

2) Circuit Operation (CPU Main Function)

- ① Thermal head strobe and latch signal production
- ② Screen feed motor drive pulse production
- ③ Paper feed motor drive pulse production
- ④ Lamp drive signal production
- ⑤ LED turn on signal production
- ⑥ Key input accept
- ⑦ Start signal production to memory the WHITE waveform of the blank area of the screen.

- ⑧ Signals production described below
CCO signal is made by using Timer 1, and Timer 2.
CCO signal is used by Gate Array IC103 to make line start signal INT.
It interrupts CPU, and CPU starts 1 line sequence synchronizing with this, so almost all other signals are synchronizing with this signal. ENBIM signal "H" means available interval of the signal from the analog video circuit.
PAPW signal "H" means available interval of the signal HDATA, which is fed to Thermal Head.
When PAPALL signal is "L", the clock CLKHD is stopped to feed to Thermal Head.



CPU Outward Form

KX-B620 Series
KX-B520 Series

CPU pin function are as follows:

| Pin no. | Terminal name | Signal | Function | input/output | Description |
|---------|---------------|---------|------------------------------------|--------------|--|
| 1 | RESET | RESET | Reset signal input | in | When the reset signal is input to the CPU, the CPU resets all signals. |
| 2 | INT | INT | CCD synchronizing interrupt signal | in | When this signal is input, the CPU starts one line sequence. |
| 3 | AVSS | GROUND | CPU analog ground | | GROUND |
| 4 | VREF | +5V | Analog standard power supply | | Supply voltage is +5 volts. |
| 5 | K0 | FEED | Screen feed signal | in | When the advance key is pressed, this signal becomes "H". |
| 6 | K1 | COPY | Copy signal | in | When the copy key is pressed, this signal becomes "H". |
| 7 | K2 | THERM | Temperature of the thermal head | in | Temperature of the thermal head is input. |
| 8 | K3 | VPEAK | CCD peak voltage | in | CCD peak voltage is input. |
| 9 | AVDD | +5V | Analog power supply | | Supply voltage is +5 volts. |
| 10 | S0 | SMB | Screen feed motor B phase signal | out | This signal excites B phase coil. |
| 11 | S1 | SMA | Screen feed motor A phase signal | out | This signal excites A phase coil. |
| 12 | S2 | SMB | Screen feed motor B phase signal | out | This signal excites B phase coil. |
| 13 | S3 | SMA | Screen feed motor A phase signal | out | This signal excites A phase coil. |
| 14 | S4 | PMB | Paper feed motor B phase signal | out | This signal excites B phase coil. |
| 15 | S5 | PMA | Paper feed motor A phase signal | out | This signal excites A phase coil. |
| 16 | S6 | PMB | Paper feed motor B phase signal | out | This signal excites B phase coil. |
| 17 | S7 | PMA | Paper feed motor A phase signal | out | This signal excites A phase coil. |
| 18 | D0 | ENBIM | CCD data enable signal | out | When this signal becomes "L", CCD data is enable. |
| 19 | D1 | SHSTM | Blank area start signal | out | When this signal becomes "H", IC109 stores all white waveform to the memory. |
| 20 | CNVSS | GROUND | GROUND | | GROUND |
| 21 | VSS | GROUND | CPU digital ground | | GROUND |
| 22 | D2 | LAMPPRE | Lamp preheat signal | out | This signal preheats the lamp. |
| 23 | D3 | LAMPTON | Lamp turn on signal | out | This signal turns on the lamp. |
| 24 | D4 | ENDLED | Paper end LED drive signal | out | When this signal becomes "L", paper end LED lights. |
| 25 | D5 | JP101 | Selectable paper size | in | Jumper A4 size/Cut Letter size |
| 26 | D6 | | Not used | | |
| 27 | D7 | SHEND | Screen end signal | in | When the screen comes to home position, this signal becomes "L". |
| 28 | D8 | CHGAIN | CCD gain switching signal | out | When CCD gain is insufficient, this signal becomes "H". |
| 29 | D9 | | Not used | | |
| 30 | D10 | PAEND | Paper end signal | in | When the thermal paper is exhausted, this signal becomes "H". |

| Pin no. | Terminal name | Signal | Function | input/output | Description |
|---------|---------------|-----------------------------|---|--------------|--|
| 31 | F0 | $\overline{\text{ISTB4}}$ | Thermal head strobe pulse output | out | This signal is connected to the thermal head. |
| 32 | F1 | $\overline{\text{ISTB3}}$ | Thermal head strobe pulse output | out | This signal is connected to the thermal head. |
| 33 | F2 | $\overline{\text{ISTB2}}$ | Thermal head strobe pulse output | out | This signal is connected to the thermal head. |
| 34 | F3 | $\overline{\text{ISTB1}}$ | Thermal head strobe pulse output | out | This signal is connected to the thermal head. |
| 35 | G0 | $\overline{\text{LATCH}}$ | Head data latch signal | out | When this signal becomes "L", the head data is stored in the temporary memory. |
| 36 | G1 | CCO | Original rectangle pulse for all sequence | out | This signal is the original rectangle pulse for all sequence. |
| 37 | G2 | PAPW | Thermal head data enable signal | out | When this signal becomes "H", the thermal head data is enabled. |
| 38 | G3 | $\overline{\text{PAPALLW}}$ | Thermal head clock enables signal | out | When this signal become "L", the clock to the thermal head is stopped. |
| 39 | XOUT | Not used | | | |
| 40 | XIN | XIN | External clock input | in | This clock frequency is 4 MHz. |
| 41 | CNTR | +5V | Not used | | +5V pull up. |
| 42 | VDD | +5V | Power supply | | Supply voltage is +5 volts. |

Timings of Signals from CPU are as follows:

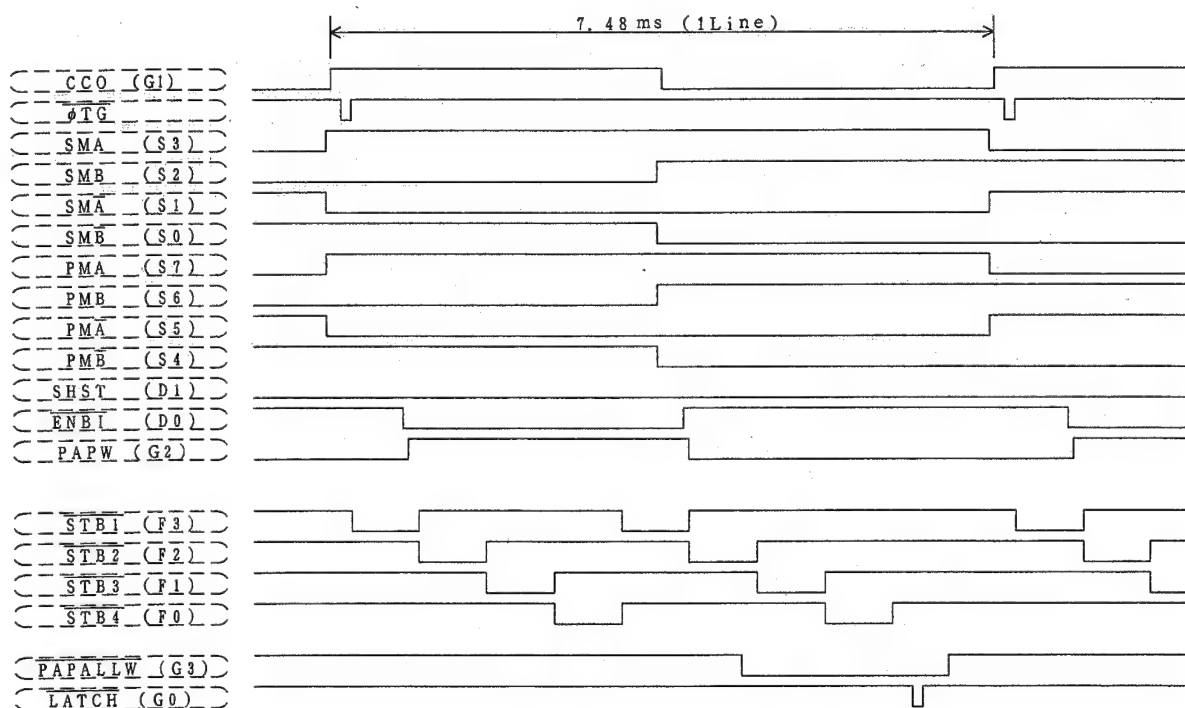


Fig. 11 TIMING CHART of Signals from CPU

2.2 Reset Signal Circuit

1) Function

When the power is turned on, or when the power is momentarily interrupted, reset pulses are generated to reset the CPU.

2) Circuit Operation

When the power is turned on and the power source V_{CC} increases to exceed +4.25 V, Reset IC (IC101) is activated, "L" signal is sent for about 3.3 ms and "H" is sent to reset the CPU (5-pin).

When the power is momentarily interrupted and power source goes down below +4.25 V, "L" signal is sent to stop the CPU. When the power is resumed and power source increases to exceed +4.25 V, "L" signal is sent for about 3.3 ms and "H" is sent to reset the CPU again.

Circuit diagram and timings are as follows:

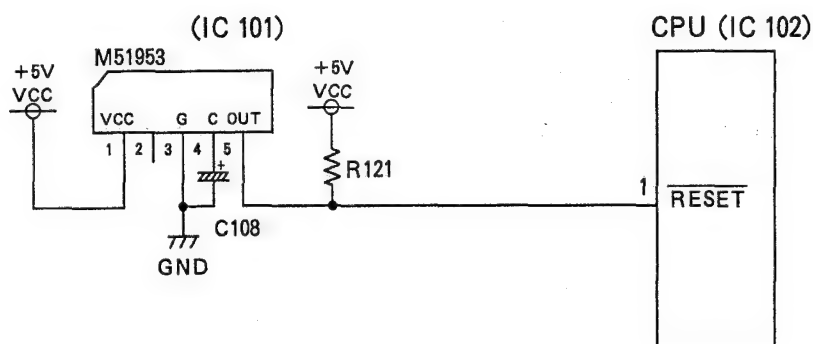


Fig. 12 Circuit Diagram

Timing chart is as follows:

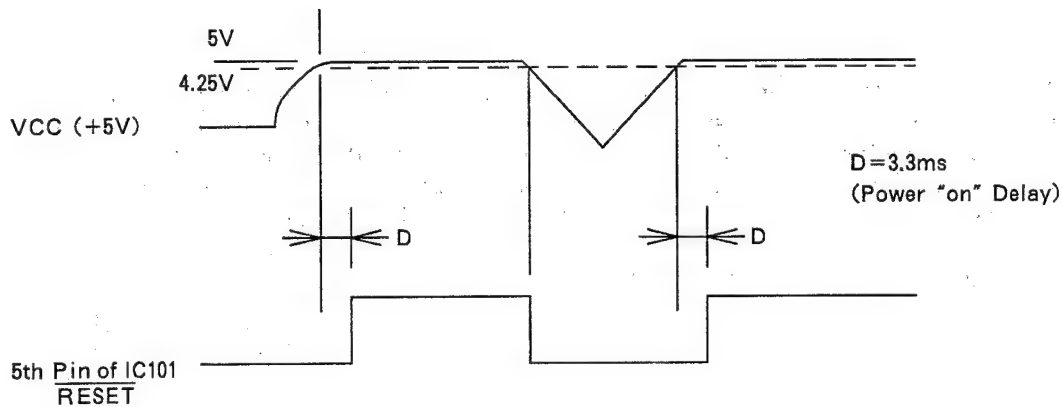


Fig. 13 Timing Chart of Power sequence

2-3 Gate Array (IC103)

- 1) Function
This gate array is divided into five section expediently.
Equivalent circuit of this gate array is Fig 15.
- 2) Circuit Operation
 - ① Oscillator section
The 4 MHz clock is produced and supplied to CPU and internal clock generation circuit.

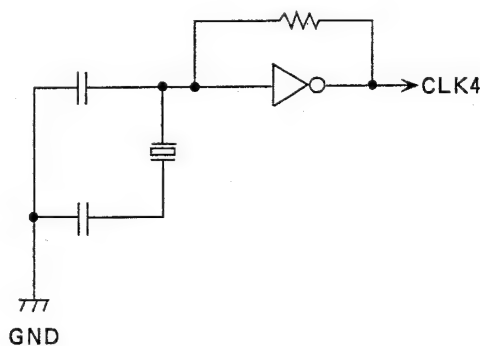


Fig. 14 Equivalent Circuit

- ② Interrupt Signal (INT) generation section
This signal is a start signal of 1 line sequence.
It is made from CCO software produced signal from CPU.
It is sampled by 250 kHz clock and synchronized with hardware timing. It interrupts CPU and makes it start 1 line sequence. For example, the thermal head strobe signals and latch signal are produced.

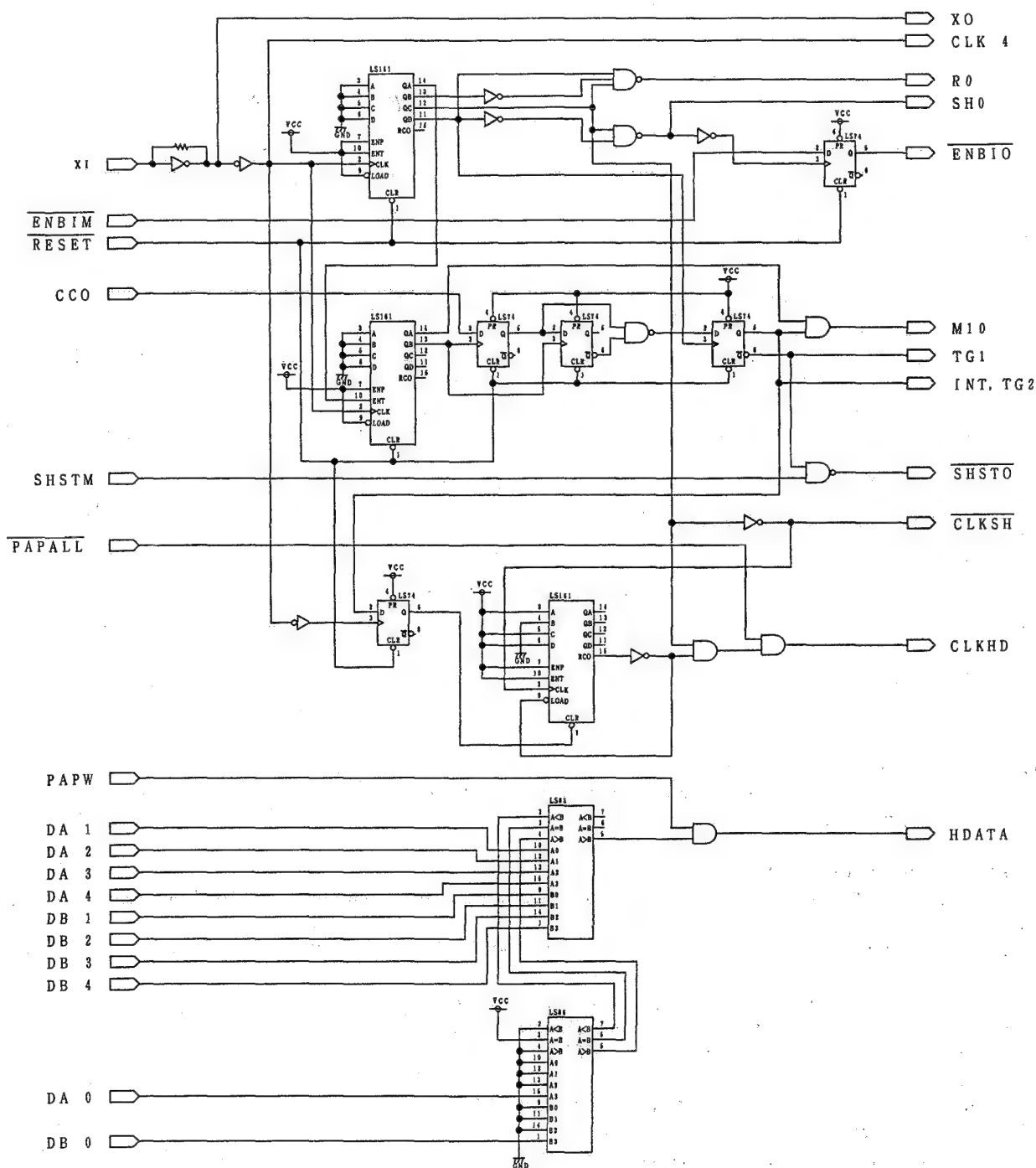


Fig. 15 Equivalent Circuit

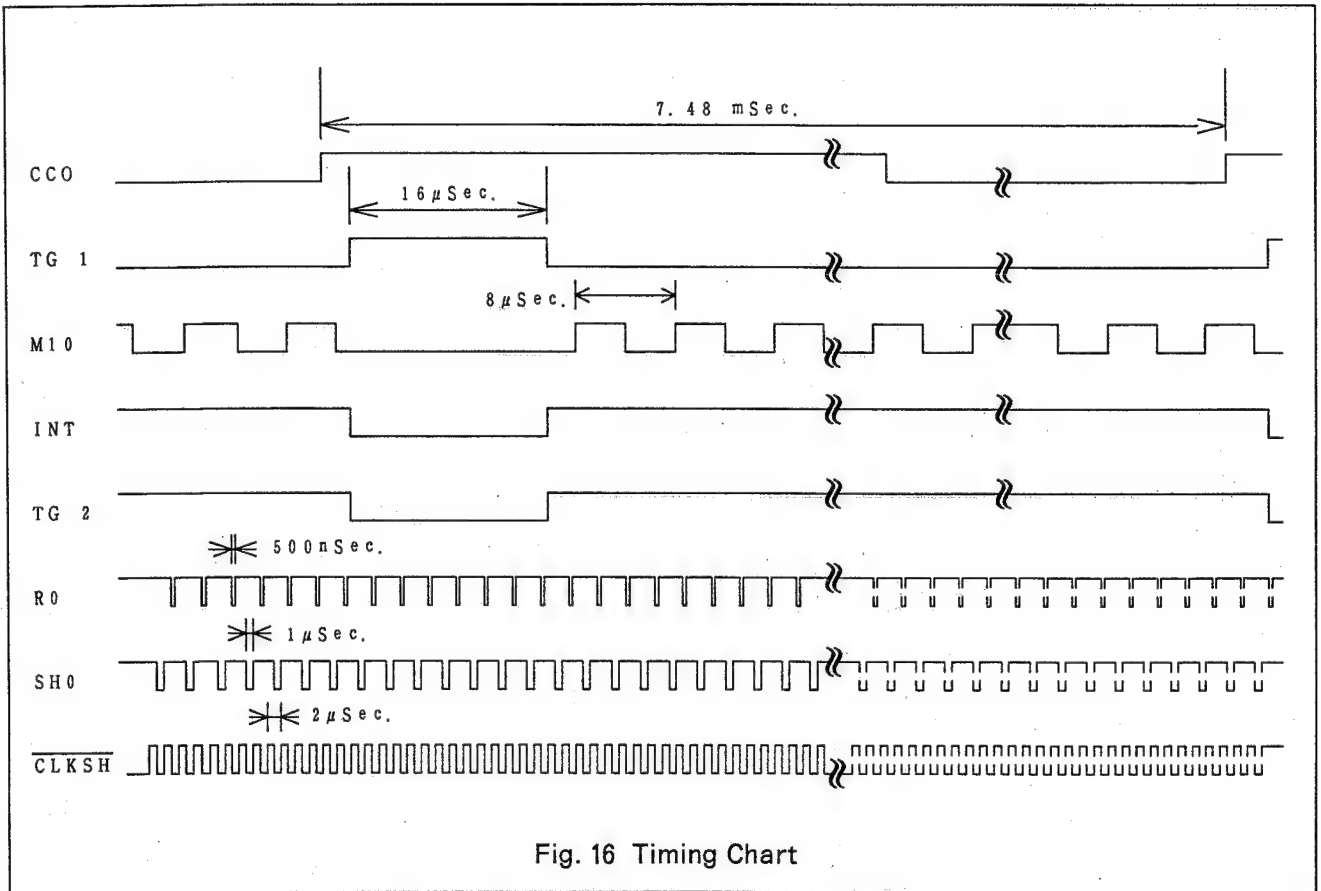


Fig. 16 Timing Chart

- ③ CCD clock generation section
 CCD clocks R0, SH0, M10 and TG2 are generated in this section.
 Timing chart is shown above.
- ④ Thermal Head clock generation section
 The number of CCD elements are 1,024 dots, and the number of elements of Thermal Head are 1,728 dots.
 The binary converted signal from the CCD is zoomed $4/3$ times, and white data for the filing space is inserted.
 This is accomplished sample the original signal by $4/3$ times the frequency clock (CLKHD) .
 CLKSH is two times the frequency of the CCD clock.
 CLKH is thinned out in $2/3$ rate from CLKSH.
- The number for CLKH is $4/3$ times compared with CCD clock.
 Then CLKH is gated by PAPALLW signal.
 White data is added moderately as a result.

The LATCH signal is produced by the CPU, and fed to the Thermal Head directly.

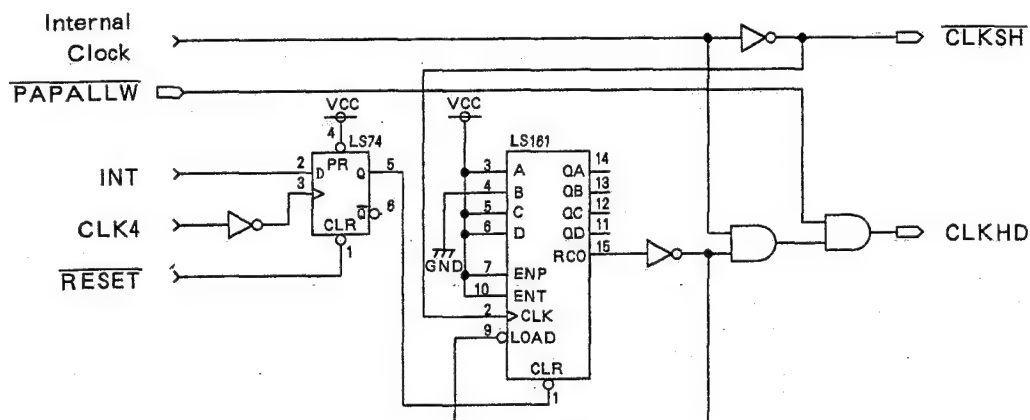


Fig. 17 Equivalent Circuit

⑤ Binary Converting section

The gray level signal (DB0–DB4) from the shading correcting and A/D convert LSI (IC109) is binary converted by the magnitude comparator.

Its signal is gated by PAPW signal.

As a result HDATA is an available signal in the CCD video signal.

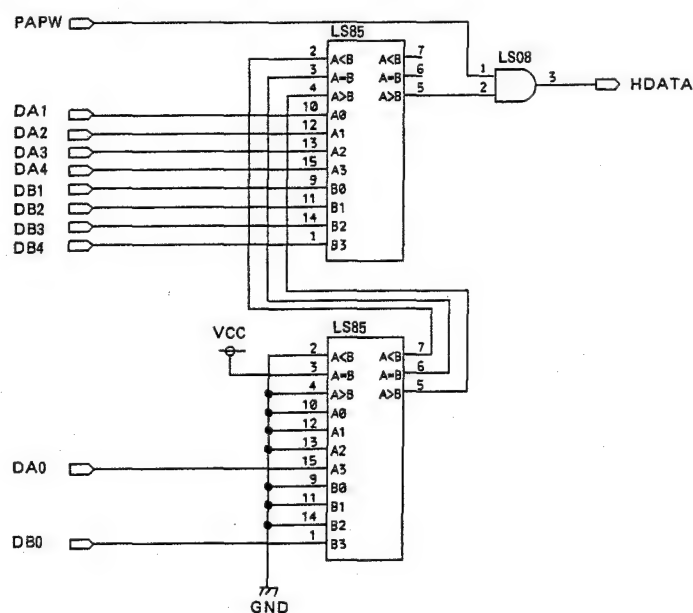


Fig. 18 Equivalent Circuit

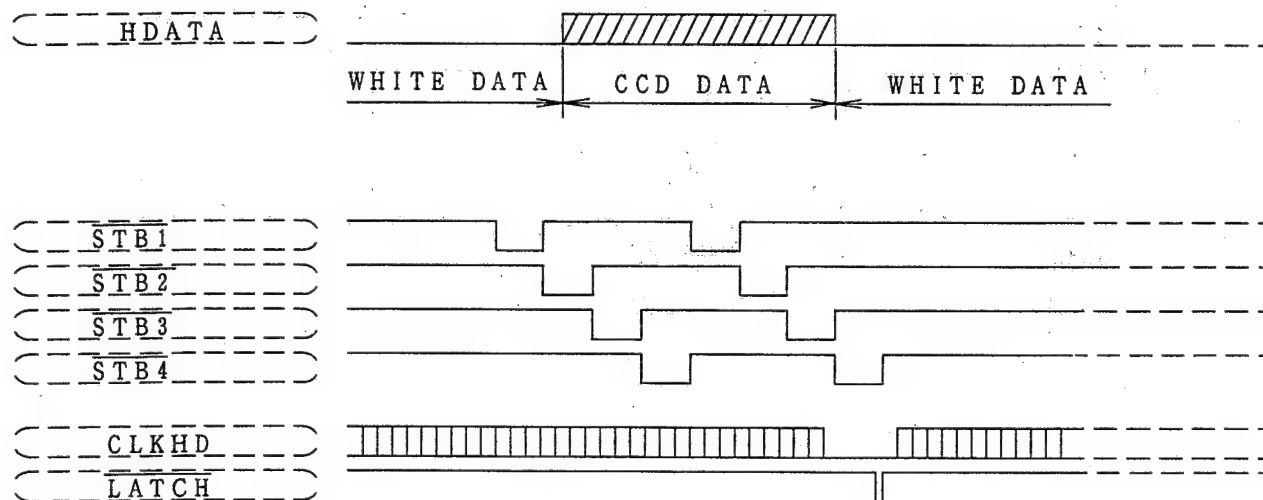


Fig. 19 Timing Chart

2-4 Stepping Motor Drive Circuit

- 1) Function
Two stepping motors are used for screen feed and paper feed.
- 2) Circuit Operation
Stepping pulses are output from CPU, causing drivers IC104, IC105 to go ON.
It makes a 1-step rotation.
Circuit Diagram and Timing Chart are shown below.

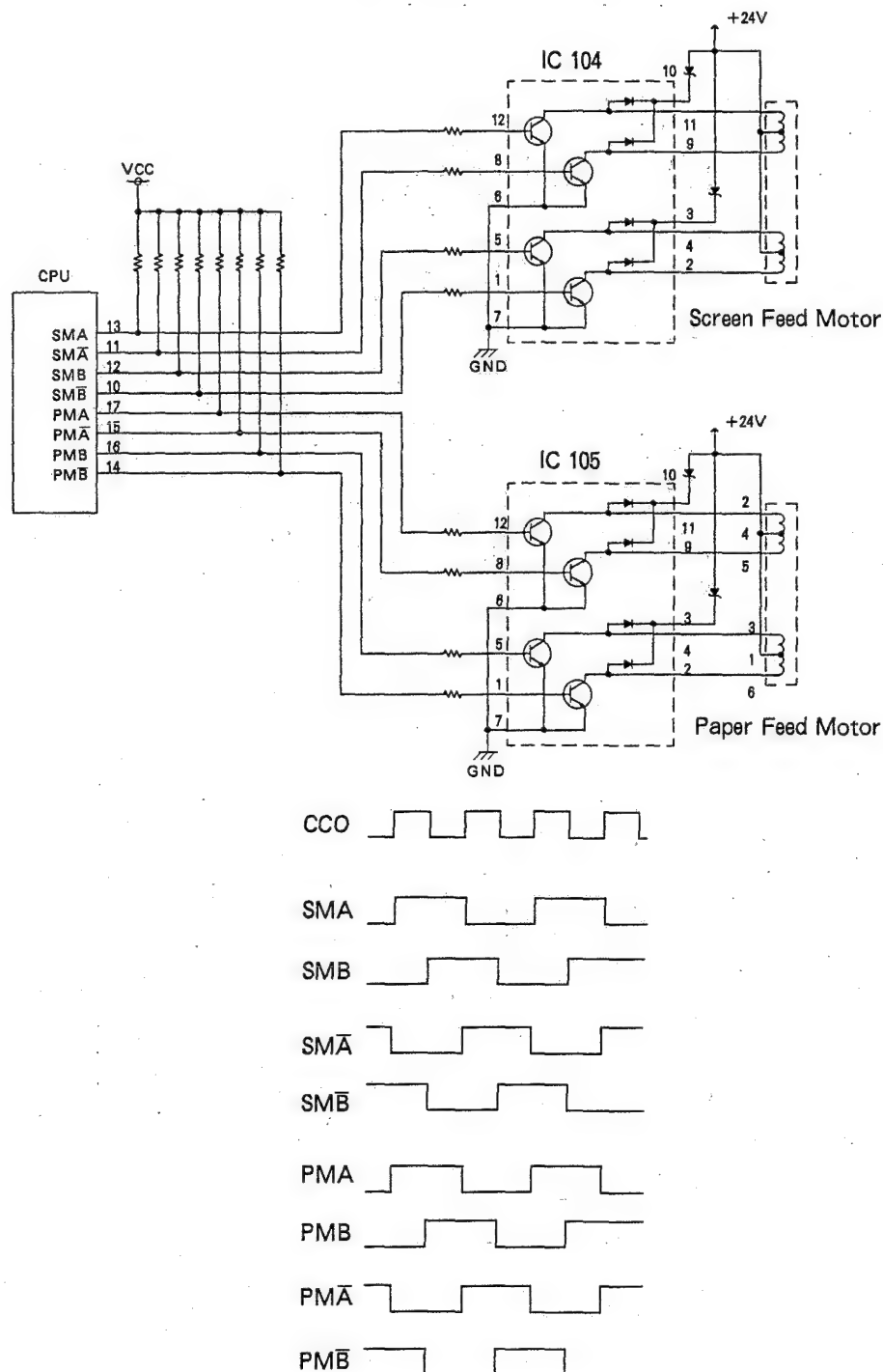


Fig. 20 Circuit Diagram and Timing Chart

2-5 Shading Correcting Circuit

1) Function

In this circuit video signal distortion called shading which is caused by the difference of the sensitivity of each photo sensor in CCD and the optical system distortion is compensated. This is accomplished by the LSI (IC109) and the memory (IC110) .

2) Circuit Operation

Circuit Diagram and the Block Diagram of LSI (IC109) are shown below.

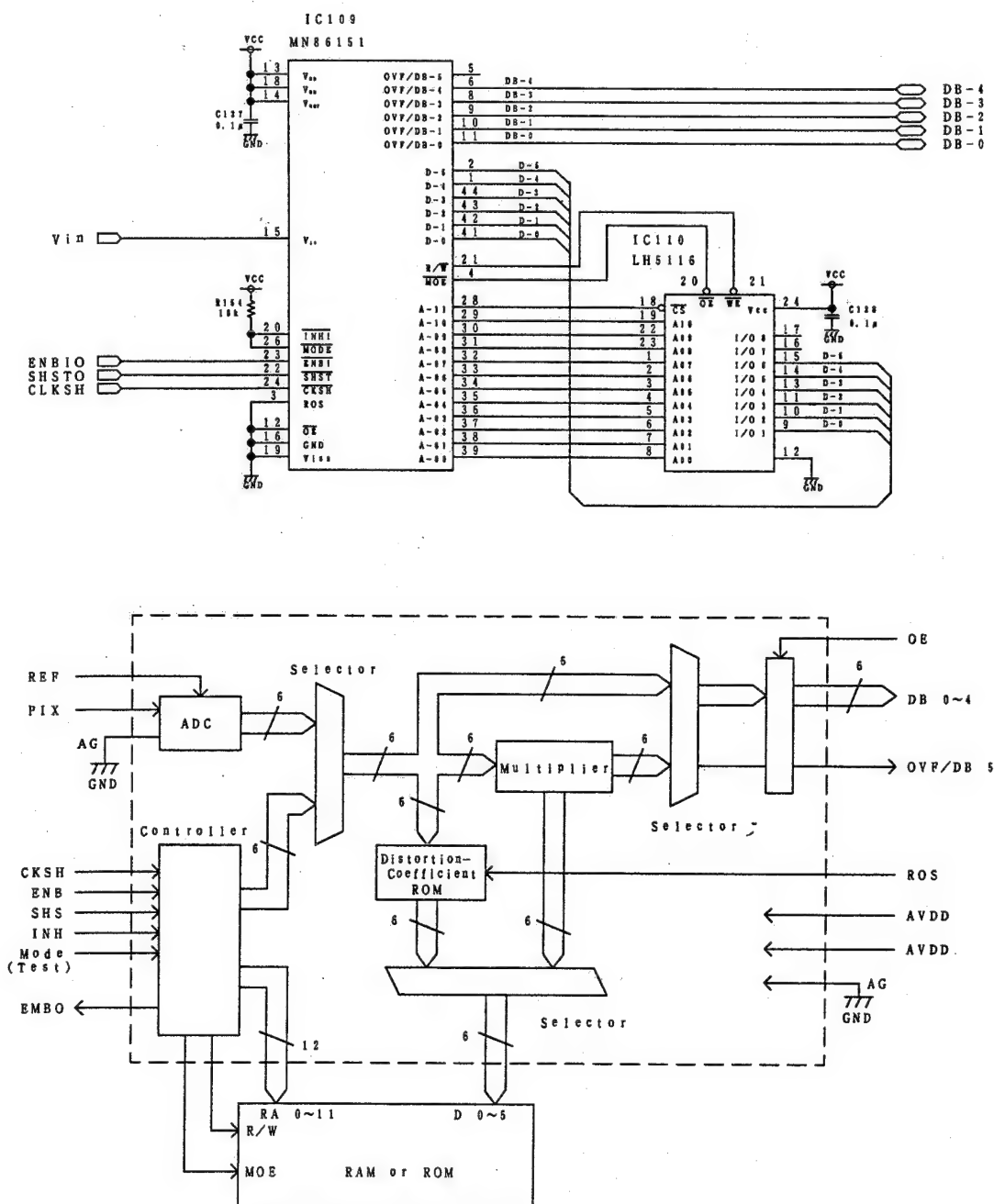
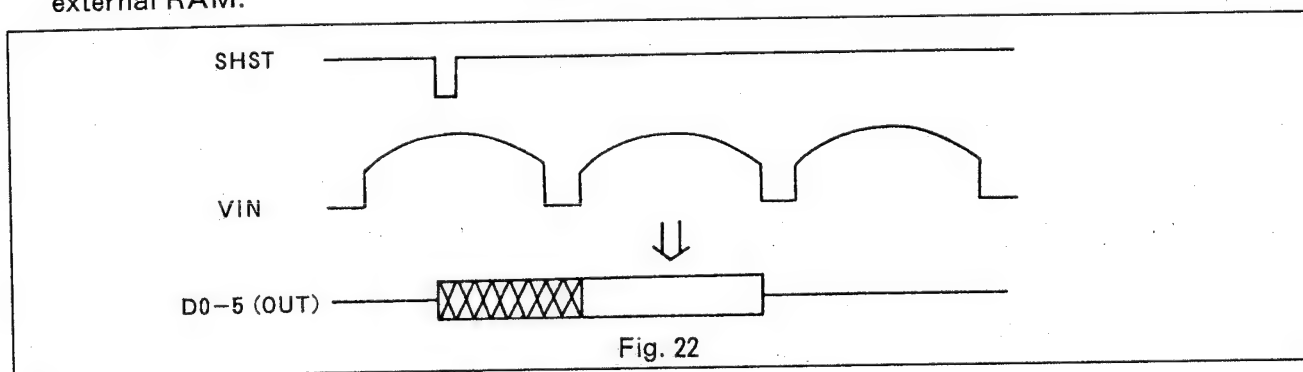


Fig. 21 Circuit Diagram and Block Diagram of IC109

- ① Explanation of the block diagram of LSI MN86151
 This LSI is composed of four blocks, the ADC section, ROM section, MUL section and CTL section.
 Each section's operation is as follows:
 - ADC (Analog to Digital Converter) section
 The pix signal (the video signal from the analog circuit) is compared with the REF signal (+5V), and converted to digital 6 bit signal.
 - ROM (Mapping Read Only Memory) section
 The distortion coefficient data is mapped to the external RAM by this mapping ROM.
 The Output of ADC section is used for the address of this ROM.
 - MUL (Multiplier) section
 This section is a multiplier of 6×6 bit.
 - CTL (Control) section
 The functions of this section are control of shading correcting, control of ADC, and interface to external RAM.
- ② Operation of LSI
 (Step 1) Blank (white area) reading
 The video signal of the blank (white area) is inputted in VIN pin, and "L" pulse is fed in SHST pin, which causes this LSI to memory the distortion coefficient 6 bit data for each pixel to the external RAM.



The coefficient data is induced from the following formula.

D_K : distortion coefficient data ($\phi - 63_{10}$)

D_w : base data of white ($\phi - 63_{10}$)

$D_w = \text{Int.} [(V_w / 5) \times 64 + 0.5]$

V_w : video signal voltage of white area (0–5V)

a) 50% compensative Mode (not used)

$D_K = \text{Int.} (2,048 / D_w)$

(If V_w is below 2.5V, D_K is fixed to 63.)

b) 75% compensative Mode

$D_K = \text{Int.} (1,024 / D_w)$

(If V_w is below 1.25V, D_K is fixed to 63.)

(Step 2) Compensation

"H" level of SHST is inputted and video signal of the document area on the screen is inputted from VIN pin.

This LSI calculates the compensated output data of each pixel from the video signal and the distortion coefficient data of the external RAM.

The data is induced from the following formula.

D_B : compensated output data ($\phi - 31_{10}$)

D_K : distortion coefficient data ($\phi - 63_{10}$)

D_p : document signal data ($\phi - 63_{10}$)

$D_p = \text{Int.} [(V_p / 5) \times 64 + 0.5]$

V_p : video signal voltage document area (0–5V)

a) 50% compensative mode (not used)

$D_B = \text{Int.} (D_p \times D_K / 64)$

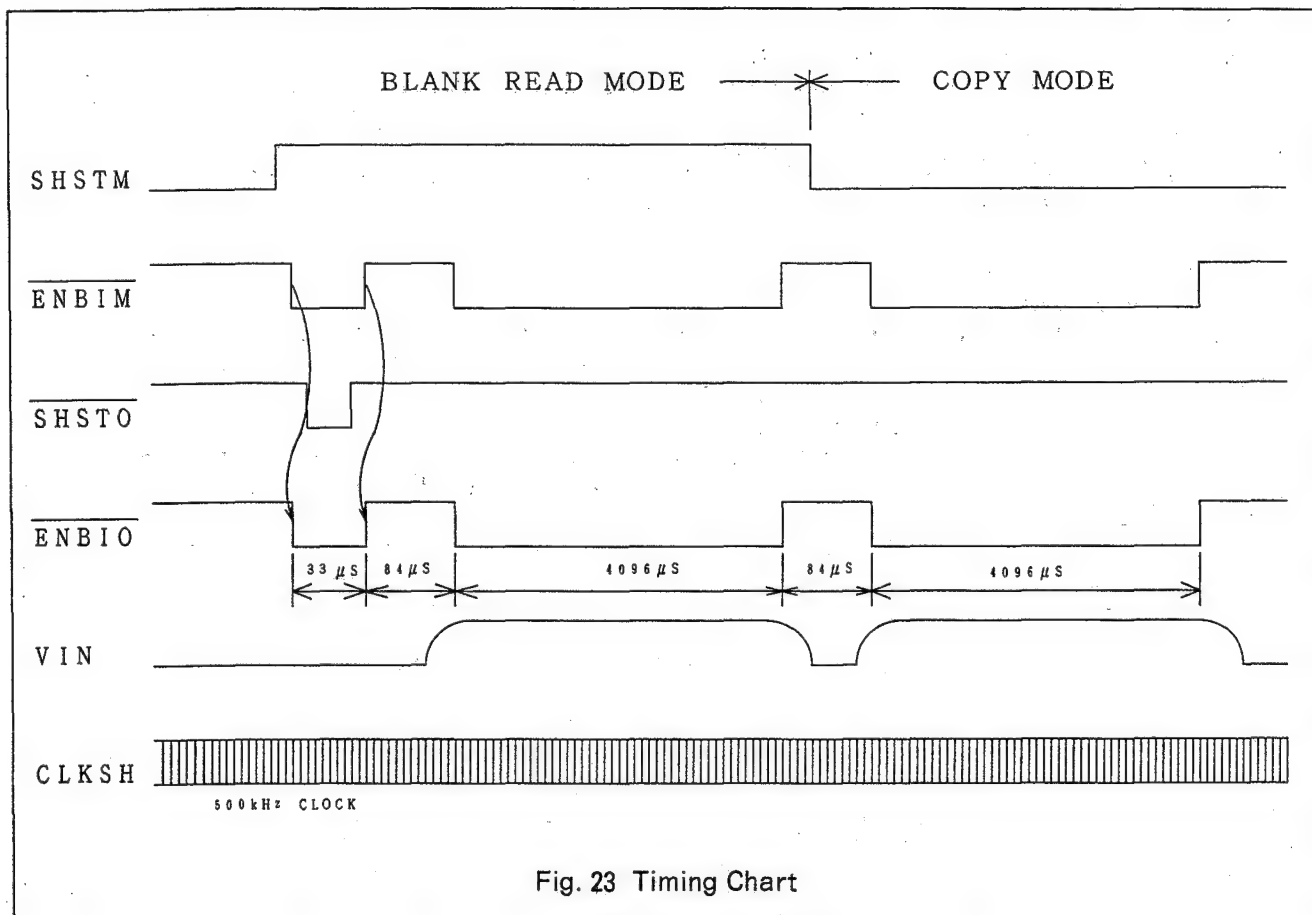
b) 75% compensative mode

$D_B = \text{Int.} (D_p \times D_K / 32)$

If $D_B \geq 32$, then $D_B = 31_{10}$ and $OVF = 'H'$

If $D_B < 32$, then $D_B = D_B$ and $OVF = 'L'$

③ Timing chart of signals.



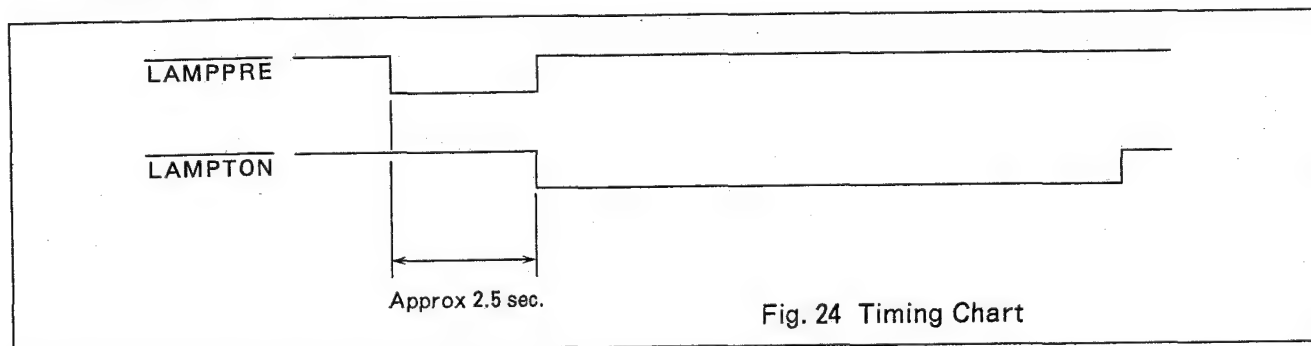
ENBIN signal and SHSTM signal are made by the CPU, and synchronized with the CCD signals by Gate Array (IC103) .

As a result, SHSTO signal and ENBIO signal are made and fed to LSI (IC109) .

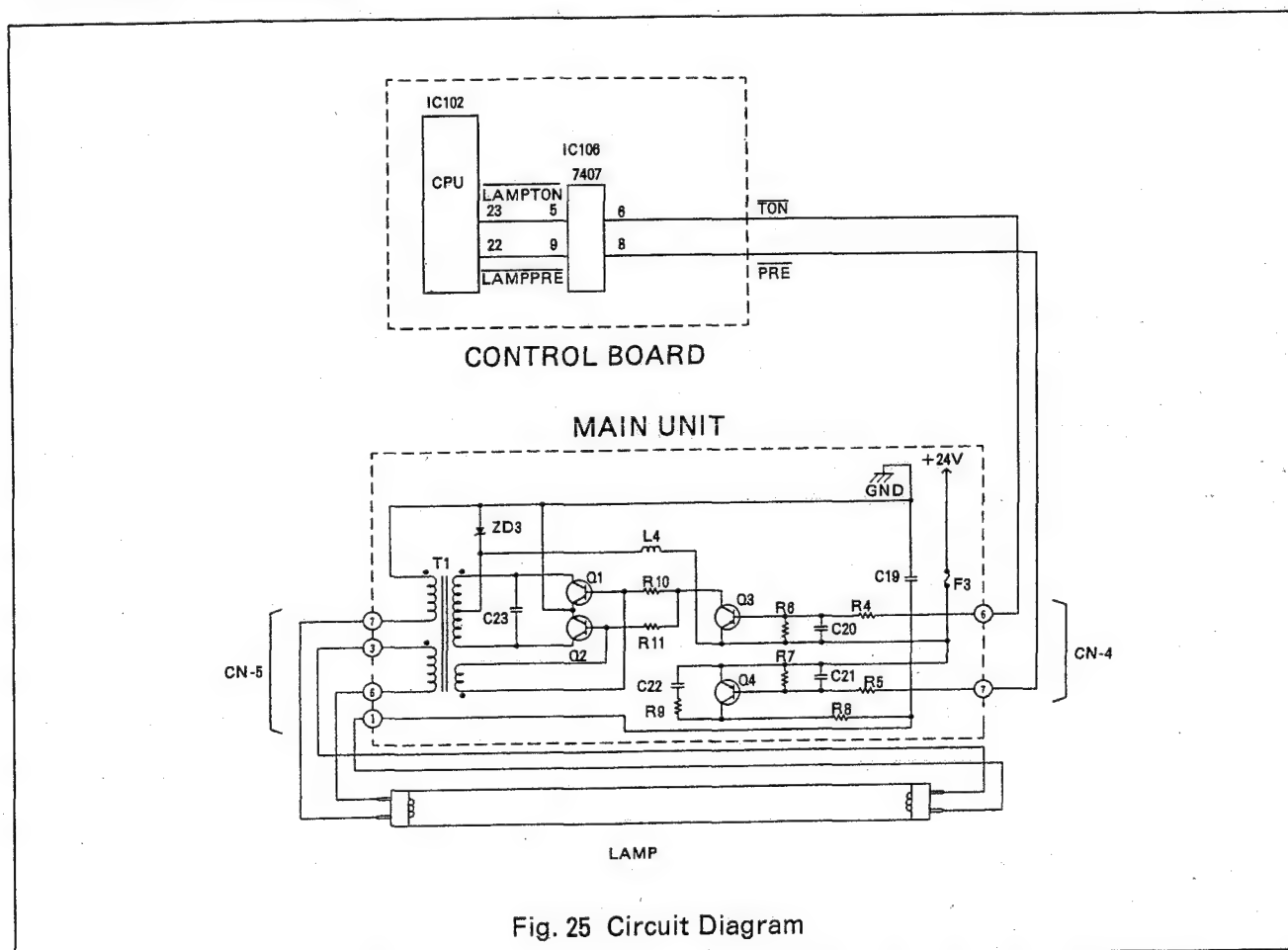
When the ENBIO signal is "L", the LSI converts input video signal into digital 6 bit signal.

2-6 Lamp Drive Circuit

- 1) Function
Lamp drive circuit is on the power supply board.
Control signals for Lamp drive circuit are supplied from CPU.
Lamp driver lights the fluorescent lamp at high frequency to prevent flickering.
It also preheats the filament just before turning it on to reduce blackening. (increase its life)
- 2) Circuit Operation
CPU makes two signals, LAMPPRE and LAMPTON.
Timing is shown below.



Transistor Q4 in the Lamp Driver turns on by the LAMPPRE signal, so preheat current flows through the Lamp filaments.
Then self oscillating circuit composed of Q1, Q2, T1, C23 and L4, start oscillating at about 47 kHz by the LAMPTON signal.
It supplies AC110V, 47 kHz power source to the Lamp, so the Lamp turns on.

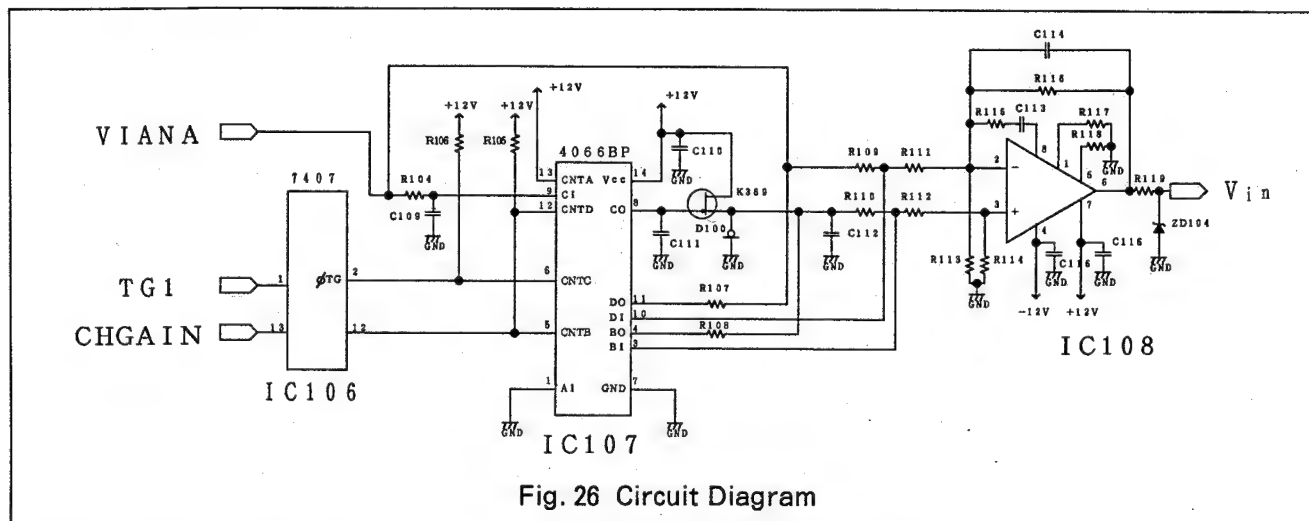


2-7 Video Signal Level Shift Circuit

1) Function

This analog circuit converts the video signal from the CCD board to the appropriate DC level and gain signal for the IC 109.

2) Circuit Operation

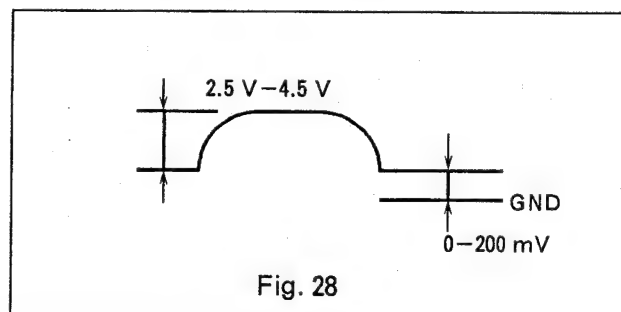
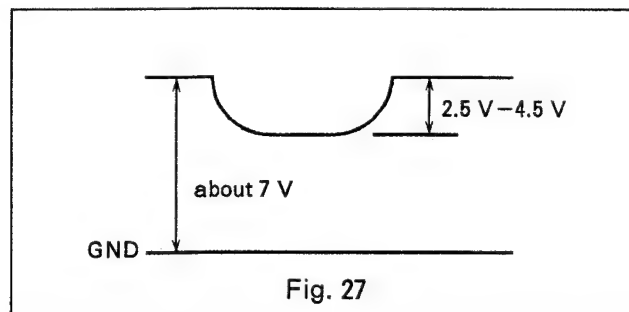


The digital conversion LSI (IC109 "MN86151") inputs must be as follows:

Black Level = 0V

White Level = 5V

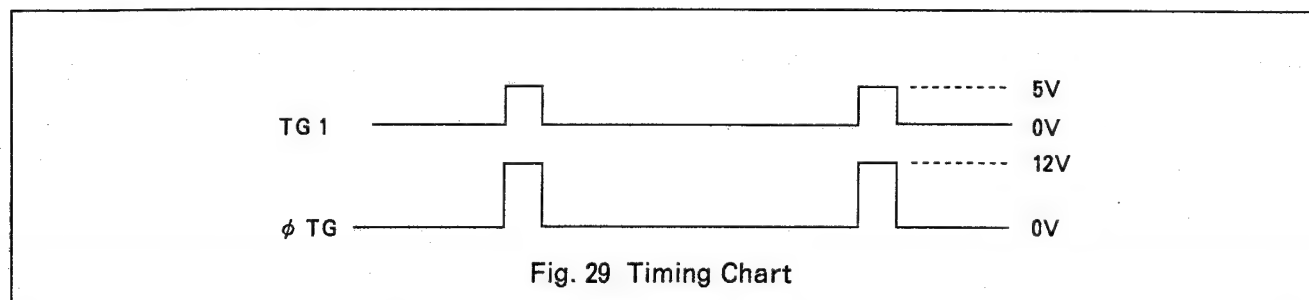
Because of the necessity of the conditions it is necessary to shift the DC level of the signal as shown below.



Black level of the signal from the CCD board is about 7V as shown above.

Its level is sampled and held by the analog switch IC107 and condenser C111 at the timing of ϕ TG.

Signal level of TG1 and ϕ TG is shown below.



This black level is subtracted from the original video signal, and still more the video signal is inverted. This is accomplished by the differential amplifier IC108.

2-8 Thermal Head

1) Function

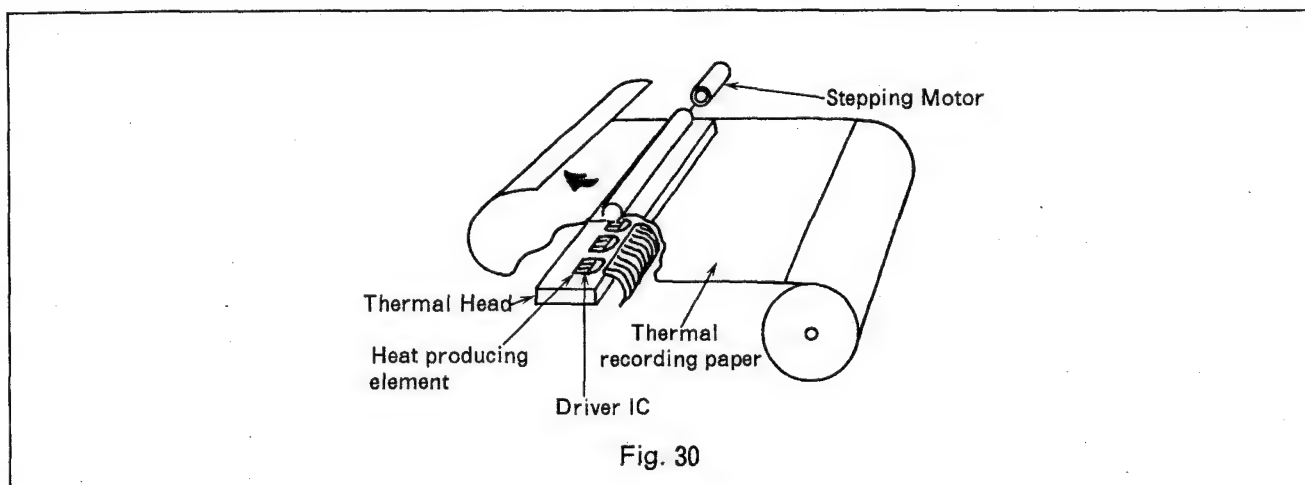
This unit utilizes state of the art thermal printer technology.

In this format, the recording paper (roll paper) is chemically treated and heat sensitive.

When the thermal head contacts this paper, the "Black" signal comes from the forwarding side, the thermal head emits heat momentarily and black dots (appearing almost as a point) are printed on the paper.

If this point is continued, letters and/or diagrams appear.

Composition of Printer Section

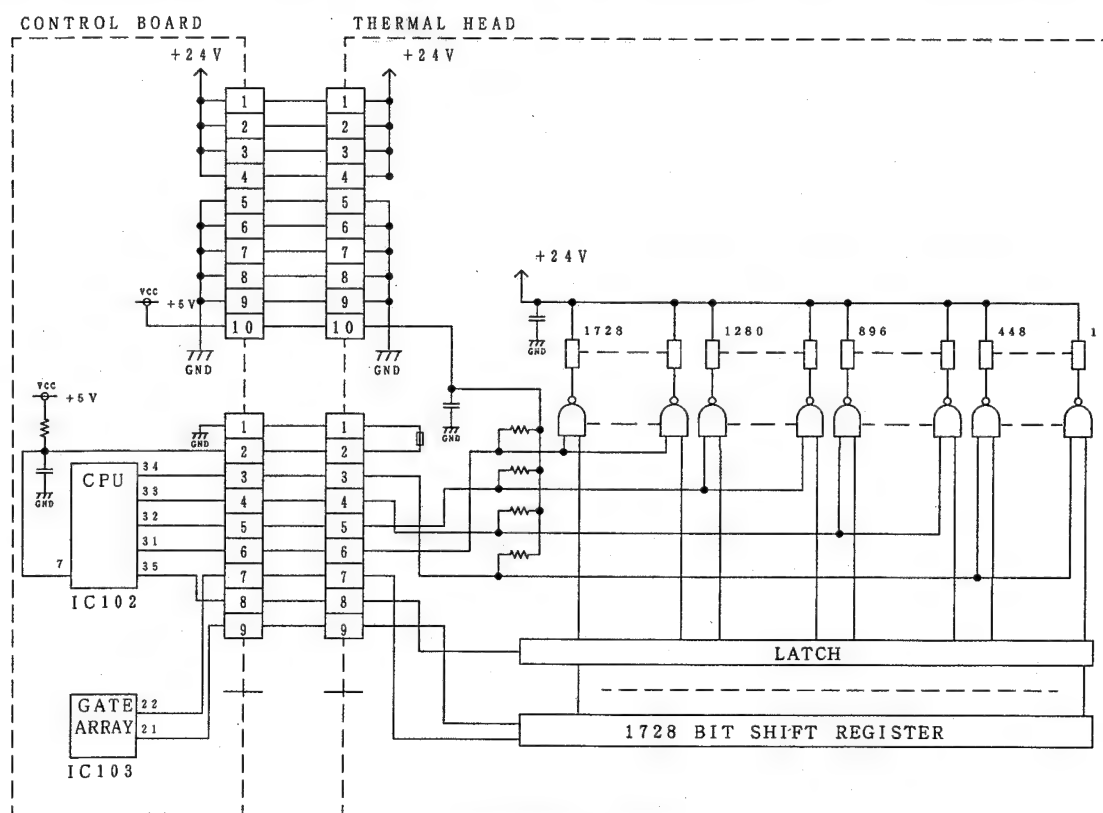


2) Circuit Operation

There are 27 driver ICs aligned horizontally on the thermal head and each one of these ICs can drive 64 heat emitting resistors.

This means that one line is at a density of $64 \times 27 = 1,728$ dots = (8 dots/mm).

White / Black (white = 0, black = 1) data in one line increments is synchronized at IC103 pin 22 (CLKHD) and sent from IC103 pin 21 (HDATA) to the shift register. The shift registers of the 27 ICs are connected in series, and upon shift of 1,728 dots increment, all the shift registers become filled with data, and a latch pulse is emitted to each IC from IC102 pin 35 (LATCH). With this latch pulse all the contents of shift registers are latched to the latch registers. Thereafter, through the addition of a strobe from IC103 only the dot location for black (= 1) among latched data activates driver, and current passes to heat emitting body to cause heat emission. Here the strobe of STB1 to STB4 impresses 0.84 or 0.91 msec each, two times for one line printout. The sequence is as shown below.



Equivalent Circuit

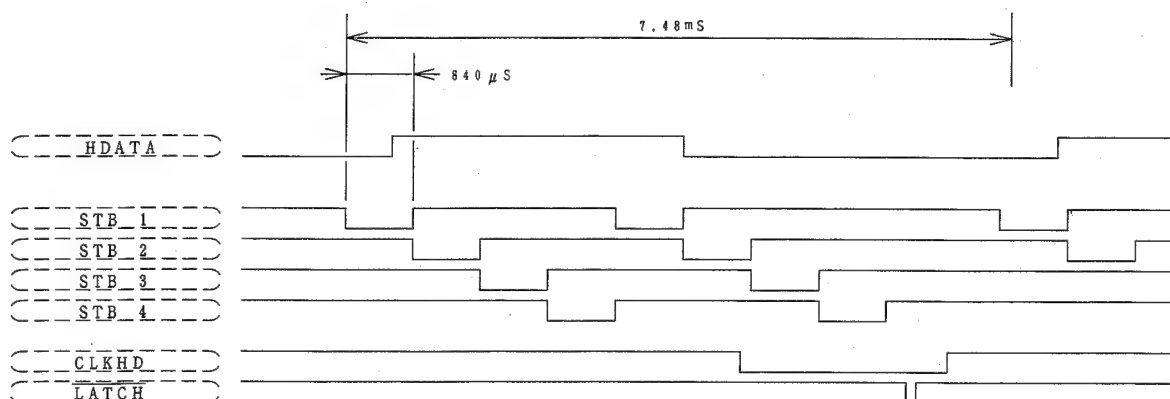


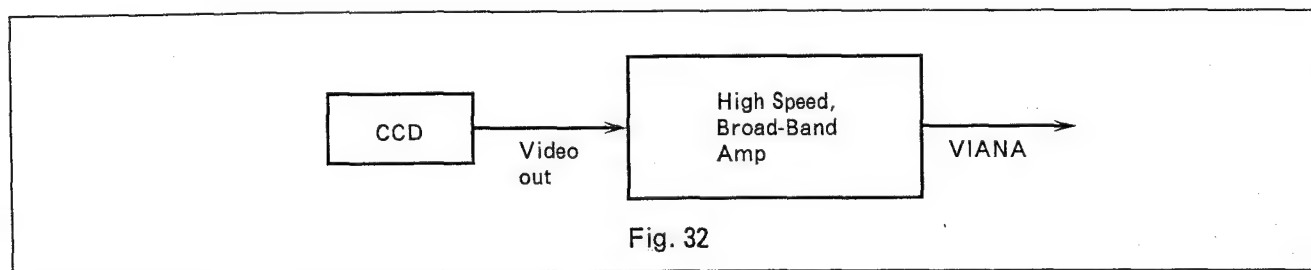
Fig. 31 Timing Chart

2-9 CCD Sensor Board

1) Function

This block is made up of the CCD sensor "UPD3575" (IC201) which has a sampling circuit inside, and broad - band amp "NJM318D" (IC202) . The main operation of the amp is amplifying the signal from CCD.

Block diagram



The fluorescent light illuminates the image on the screen, its image is reflected in a mirror, and input into the CCD. The output from the CCD is in proportion to the amount of light.

2) Circuit Operation

① CCD section

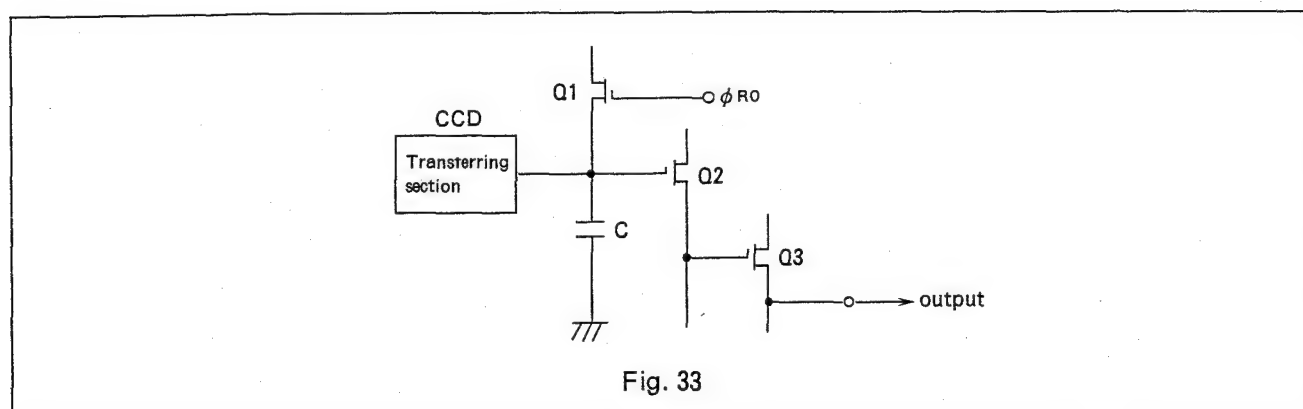
A CCD (Charge Coupled Device) is composed of the 1,024 bit linear image sensor. It converts the optical data to electrical data. The driving of CCD needs four kinds of clocks which are ϕ_{RO} , ϕ_{SH0} , ϕ_{10} and ϕ_{TG} . It is possible for CCD to drive in TTL.

Clock is inputted from the main control P.C.B. to the CCD P.C.B. through CN6.

Each Clock Description

ϕ_{RO} : Reset gate clock signal

Buffer amplifier is as follows:



KX-B620 Series KX-B520 Series

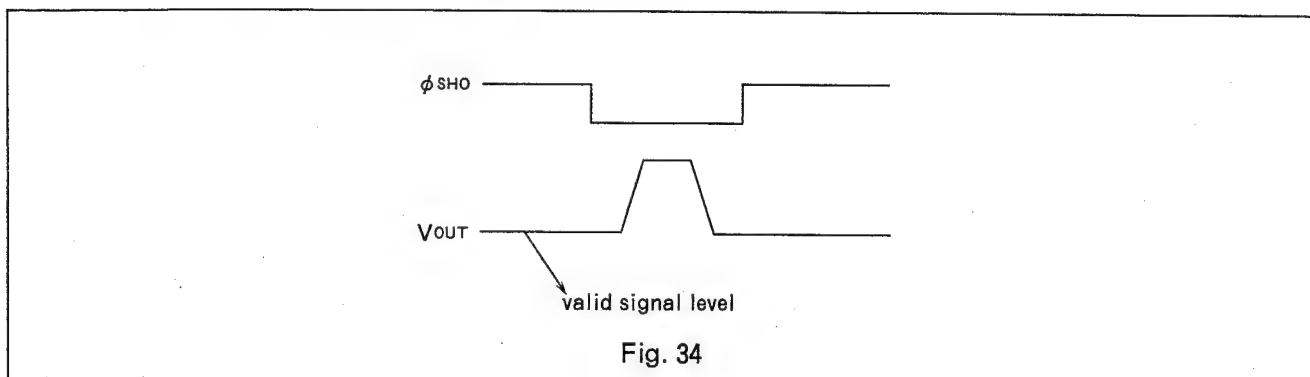
Capacitor C receives the transferred electric charge.

The voltage difference is outputted from source follower of Q2 and Q3. Q1 recovers the quantity of charge in capacitor C to the constant quantity.

ϕ_{SHO} : Sample and hold clock signal

This samples the continuous signal from CCD.

The timing of Vout is as follows:



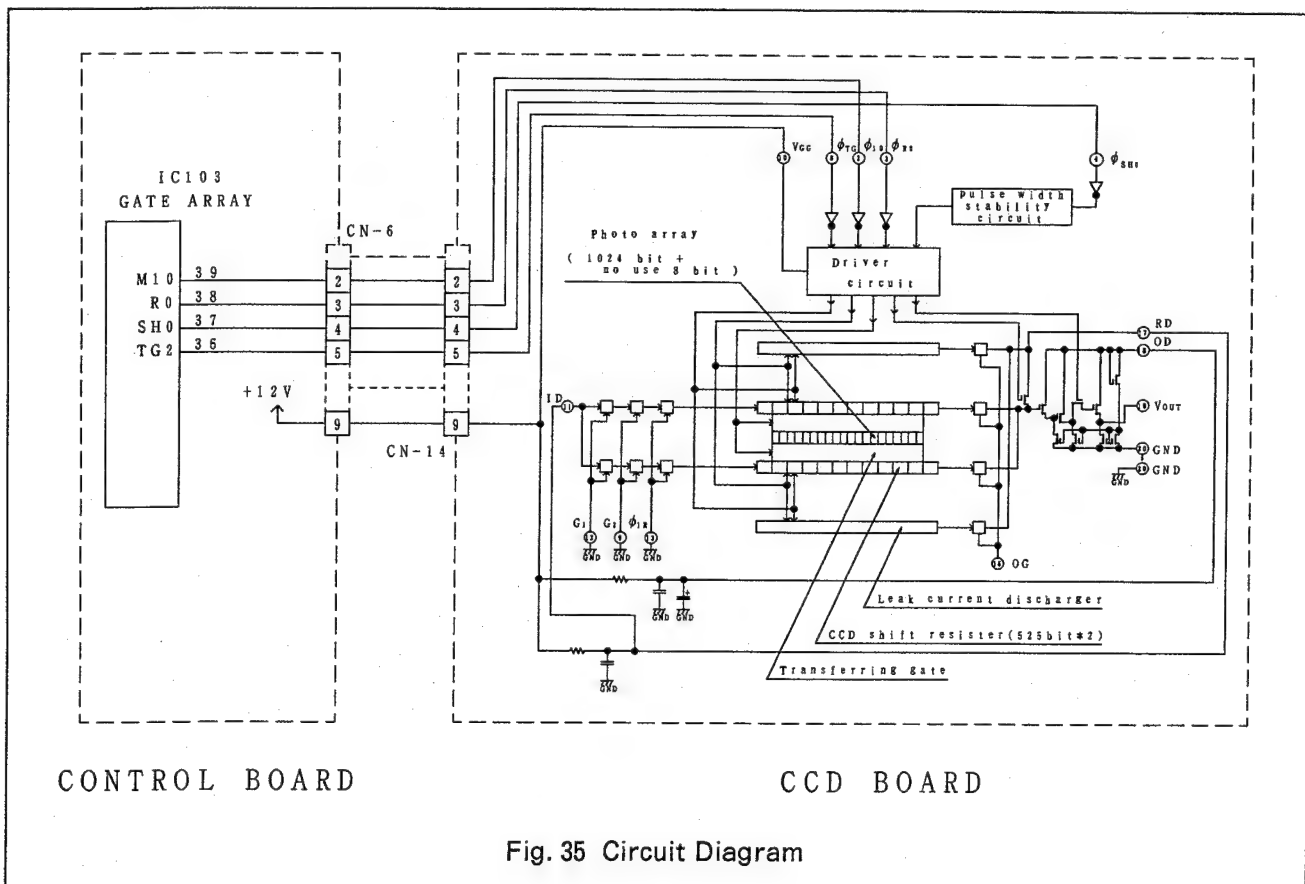
ϕ_{10} : Shift register clock signal

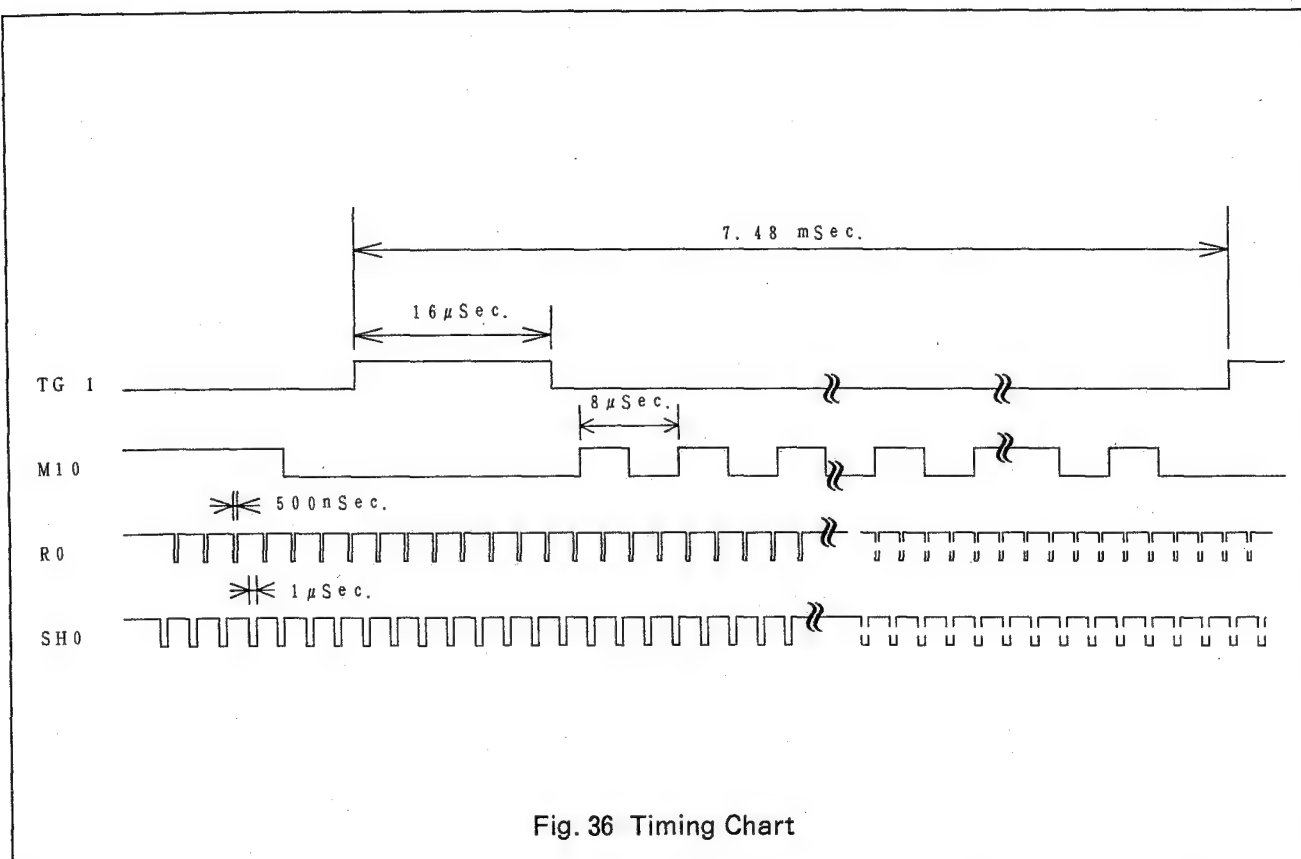
This clock signal separately shifts the transferred data in the shift register which has two lines of 525 bit.

The shifted data is sampled and held in ϕ_{SHO} , and output as Vout.

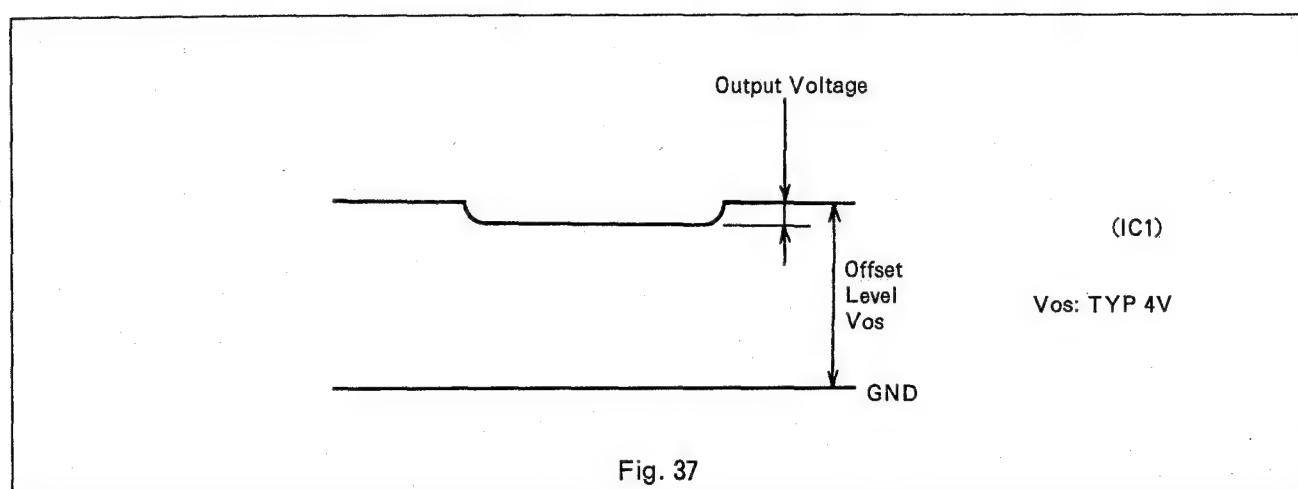
ϕ_{TG} : Transferring gate clock signal

This clock signal transfers the charge in light conversion section to the shift register. The charge in the odd element is transferred to the odd shift register. The charge in the even element is transferred to the even element. One period of transferring gate clock equals the charging time of the CCD.





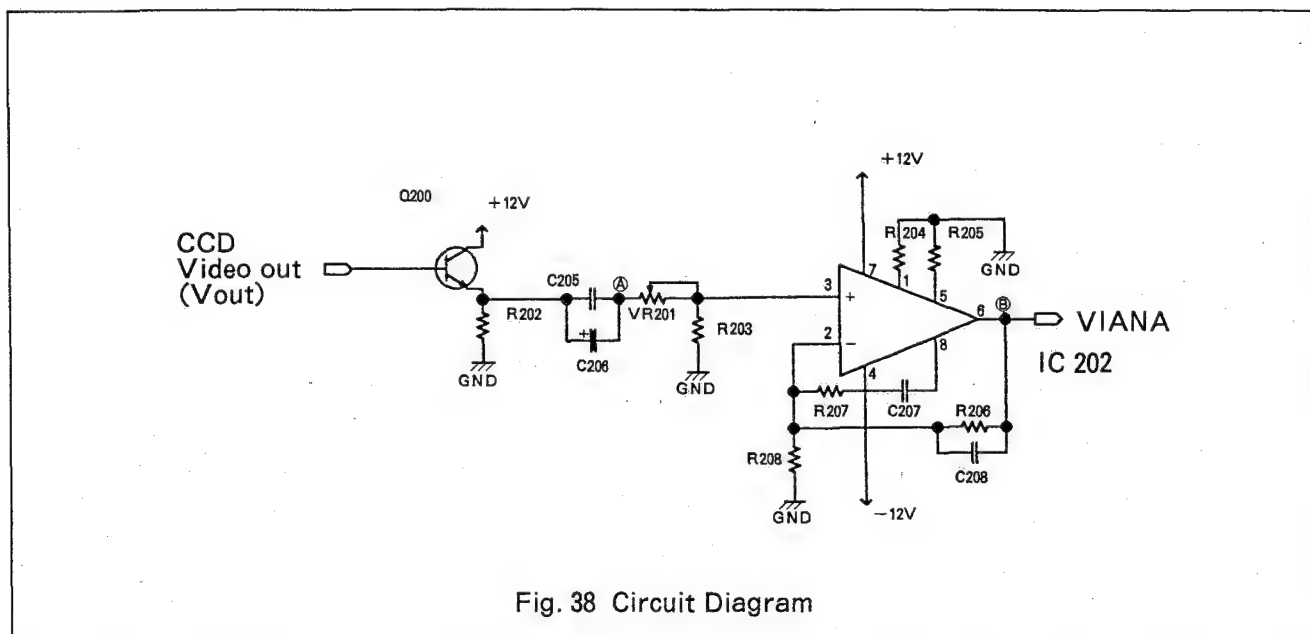
- ② Amp section
CCD output signal is shown below.



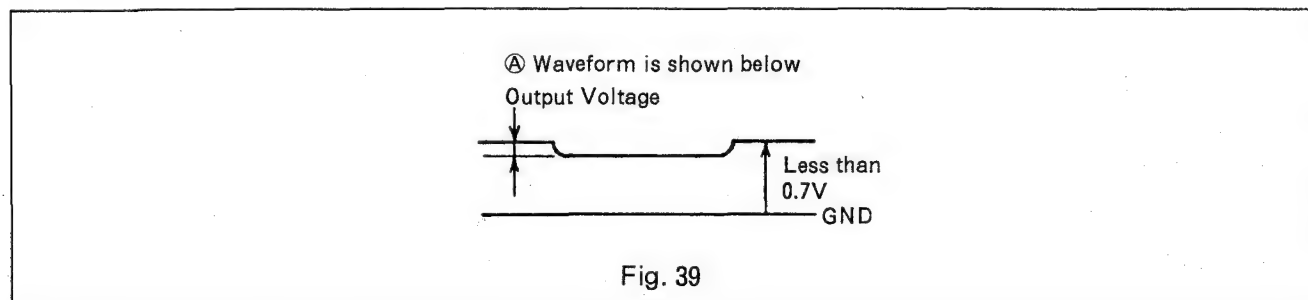
KX-B620 Series KX-B520 Series

DC level is TYP 4V, so if amplified directly, it becomes very distorted. Therefore the input for the broad-band amp is a condenser coupling circuit.

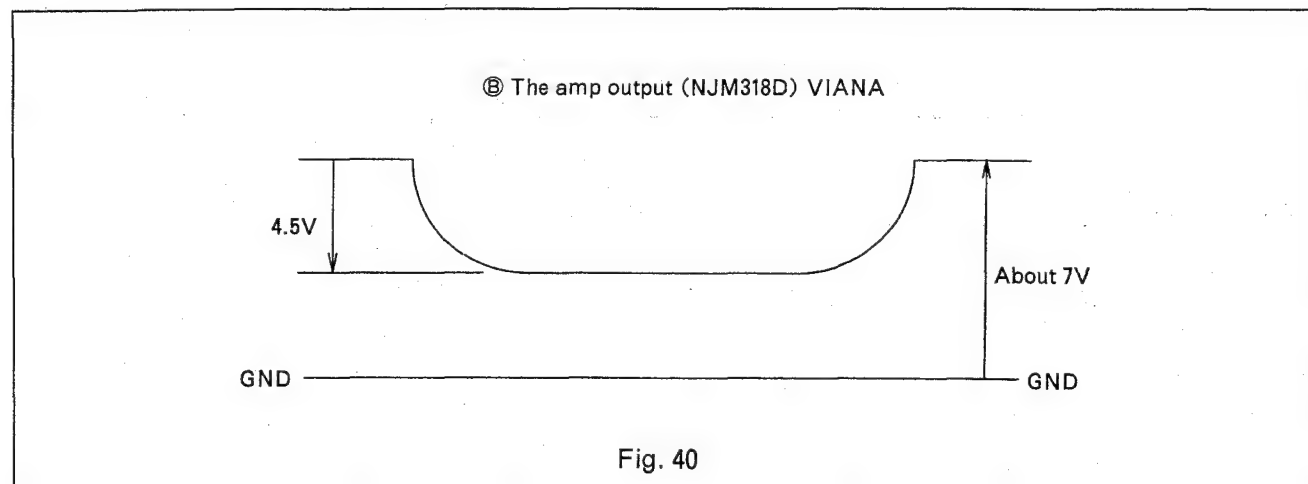
The output signal that is cut by condenser coupling circuit is amplified by IC202 (NJM318D), Gain is adjustable by VR201.



Ⓐ Waveform is shown below.



Ⓑ Waveform (VIANA) is shown below.



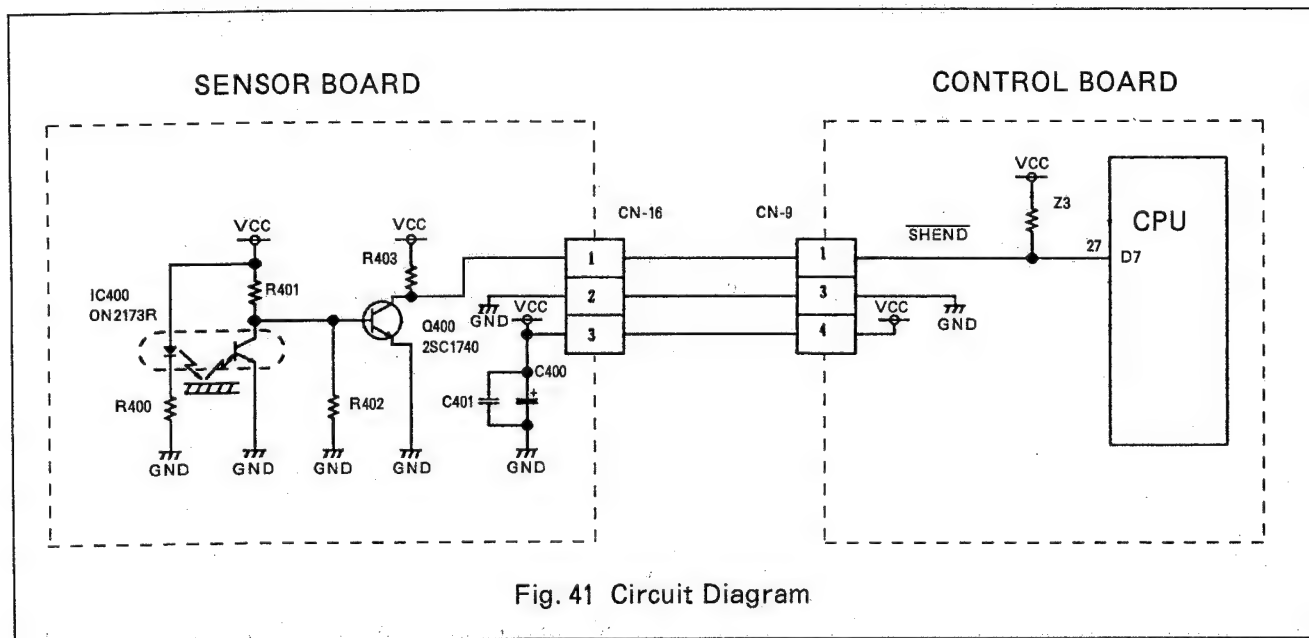
2-10 Screen Home Position Sensor Board

1) Circuit Operation

This circuit is made up of a reflective type optsensor and the buffer circuit.

There are 2 black marks at the bottom of the screen which absorbs light effectively.

When the sensor detects a black mark, the output signal "SHEND" becomes "L", and input into the CPU from D7 Port.



When the screen mark is not in position, the optical sensor "ON2173-R" IC400 receives the light being reflected by the screen and the photo-transistor is "ON". The base ① of transistor Q400 is less than 0.6 V and it remains "OFF".

When the black screen mark comes, the light is not received, the photo-transistor goes "OFF", and Q400 goes "ON". Output ② "SHEND" becomes "L".

2-11 Operation Panel Board

1) Circuit Operation

In this board, two keys and two LEDs are included, copy key, feed key, paper out LED and power LED.

Circuit diagram is shown below.

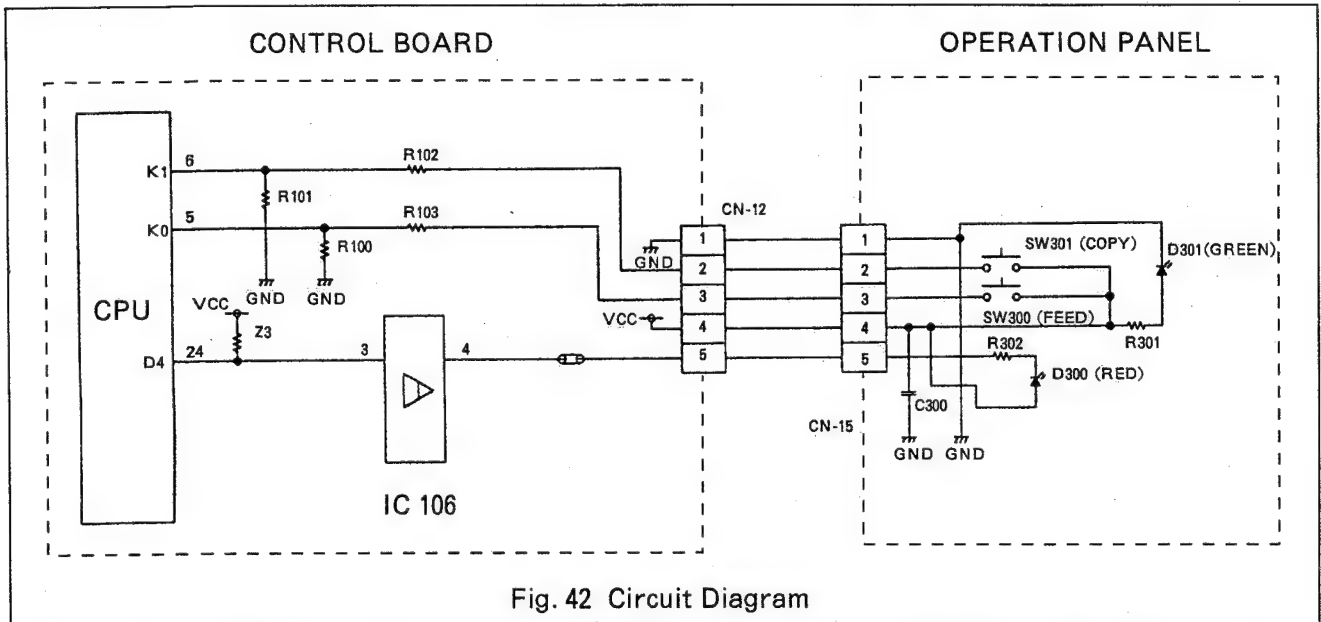


Fig. 42 Circuit Diagram

When the key is pressed, "H" signal is inputted to the CPU. According to its signal the CPU starts the programed function.

When the CPU detects the paper out signal from the paper sensor, the CPU makes a signal to turn the paper out LED on.

2-12 Paper Out Sensor

1) Circuit Operation

A micro switch is used.

When the paper is out, the micro switch is open, and accordingly the signal PAEND becomes high level.

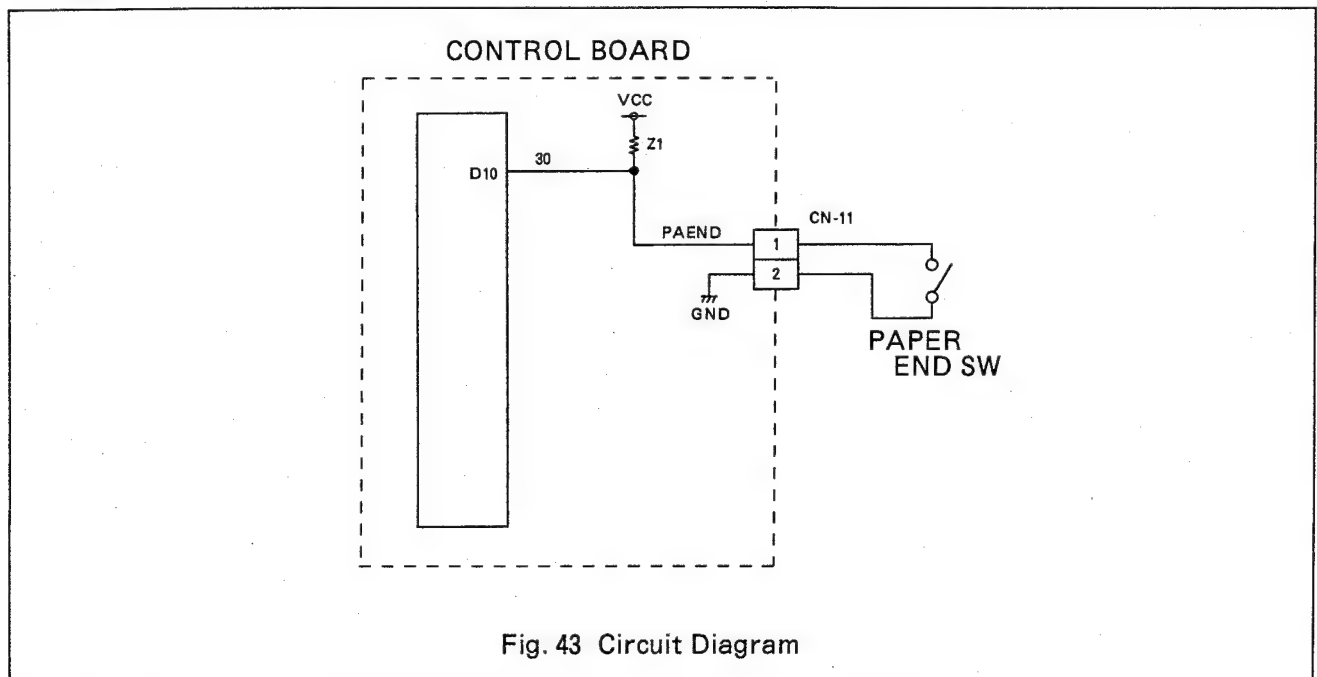


Fig. 43 Circuit Diagram

3. MAIN UNIT

3-1. +24V Output System

3-1-1. Description of Operation

IC3 is the single output regulator for 24V using step-down chopper with cut-off function.

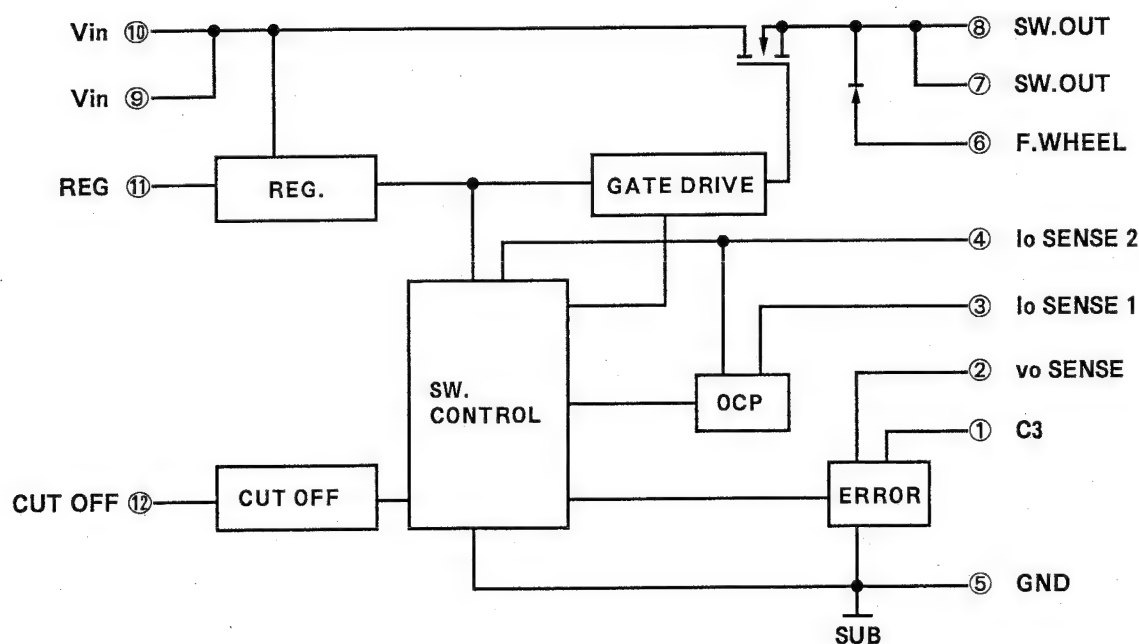
Figure below shows the block diagram of IC3.

AC voltage is supplied from pins 1 and 2 of IC3, full-wave rectified by D3 is stored at capacitor C13.

When the charging voltage of C13 exceeds DC28V, pin 12(cut-off terminal) of IC3 becomes high, IC3 is activated and DC+24V is sent to pin 2 of IC3.

L11 and L12 are choke coils, and R13 and C21 are for switching pulse reduction.

BLOCK DIAGRAM



3-1-2. Overvoltage Protection Circuit OVP

Detects the output voltage of IC3 at pin 2 of IC3, feedback, and sets it between the range of DC23.6V to DC24.4V.

When the output voltage exceeds 27V, zener diode ZD1 (27V) is activated to restrict the voltage to 27V.

3-1-3. Over Current Protection Circuit +CLM

When the output current exceeds DC10A, the voltage generated at resistor R12 between pin 3 and 4 of IC3 is detected at pin 4 of IC3, over current protection is activated to shut down the output.

3-2. DC +5V, +12V, -12V Output Systems

IC1, IC2 and IC4 are three-terminal regulators.

AC voltage is supplied from pins 3 and 4 of CN-3, half-wave rectified by D1 and D2, and is smoothed to DC by smoothing capacitors C4 and C5.

When DC voltage is supplied to three-terminal regulator IC1, IC1 is activated, and outputs DC+12. When DC voltage is supplied to three-terminal regulator IC2, it outputs DC+5V.

When DC voltage is supplied to three-terminal regulator IC4, IC4 is activated, and outputs DC -12V.

ZD2(13V) is for overvoltage protection and for noise absorption.

C6, 7, 8, 9, 10, 11 and 12 are for vibration protection and for noise absorption.

IC1, 2 and 4 have built-in over current protection circuits. Rated output voltage, rated output current, and starting current for over current protection are as follows:

| | IC1 | IC2 | IC4 |
|----------------------|------|------|------|
| Rated output Voltage | +12V | +5V | -12V |
| Rated output current | 0.5A | 0.5A | 0.5A |

3-3. Fluorescent Lamp Circuit (LAMP DRIVE)

When terminal ⑦ of CN-7 (preheat signal terminal) becomes 0V, transistor Q4 goes ON, current is supplied to Q4→R8→LAMP heater→NS1 winding (T1)→LAMP heater→NS2 winding (T1)→GND and the LAMP heater is over-heated.

The voltage is set at 7.1V, and resistor R8 and the NS1 and NS2 winding resistors divide it into +24V.

After 2.5 seconds, when the preheat signal becomes HIGH, Q4 turns off and current is not supplied to the LAMP heater, terminal ⑥ (LAMP ON signal terminal) becomes 0V, transistor Q3 goes ON, current is supplied to base resistors R10 and R11 of transistors Q1 and Q2 and then oscillation starts. This circuit is the push-pull voltage resonance circuit in which resonance occurs by primary winding inductance of transformer T1 and condenser C23, and switch it to a sine wave form.

At that time the surge voltage is generated when the LAMP turns on, Vce of Q1 and Q2 may exceed the specified value and be destroyed. To prevent this, Zener diode ZD3 is used to absorb the surge voltage.

Control P.W.B.
PBAPX12B52 (KX-B620/C, B520/C)
PBAPX12B52G (KX-B620T/G/H/U/A, B520T/G/H/S/U/A)

IC104
MP4303

COM-1 (3) B-1
COM-2 (10) B-2
C-1 (2) *B
C-2 (4) B
C-3 (9) *A
C-4 (11) A
E (6) E
E (7) E

SM*B R132 1K
SMB R133 1K
SM*A R134 1K
SMA R135 1K

IC102
M50727

RESET (1)
INT (2)
AVss (3)
Vref (4)
Xin (40)
Xout (39)
K-0 (5)
K-1 (6)
K-2 (7)
K-3 (8)
AVcc (9)
S-0 (10)
S-1 (11)
S-2 (12)
S-3 (13)
S-4 (14)
S-5 (15)
S-6 (16)
S-7 (17)
D-0 (18)
D-1 (19)
D-2 (20)
CNVss (21)
Vss (22)

FEED
COPY
THERM
VPEAK

IC101
M51953

Vcc (1)
G (2)
C (3)
OUT (4)
5 (5)

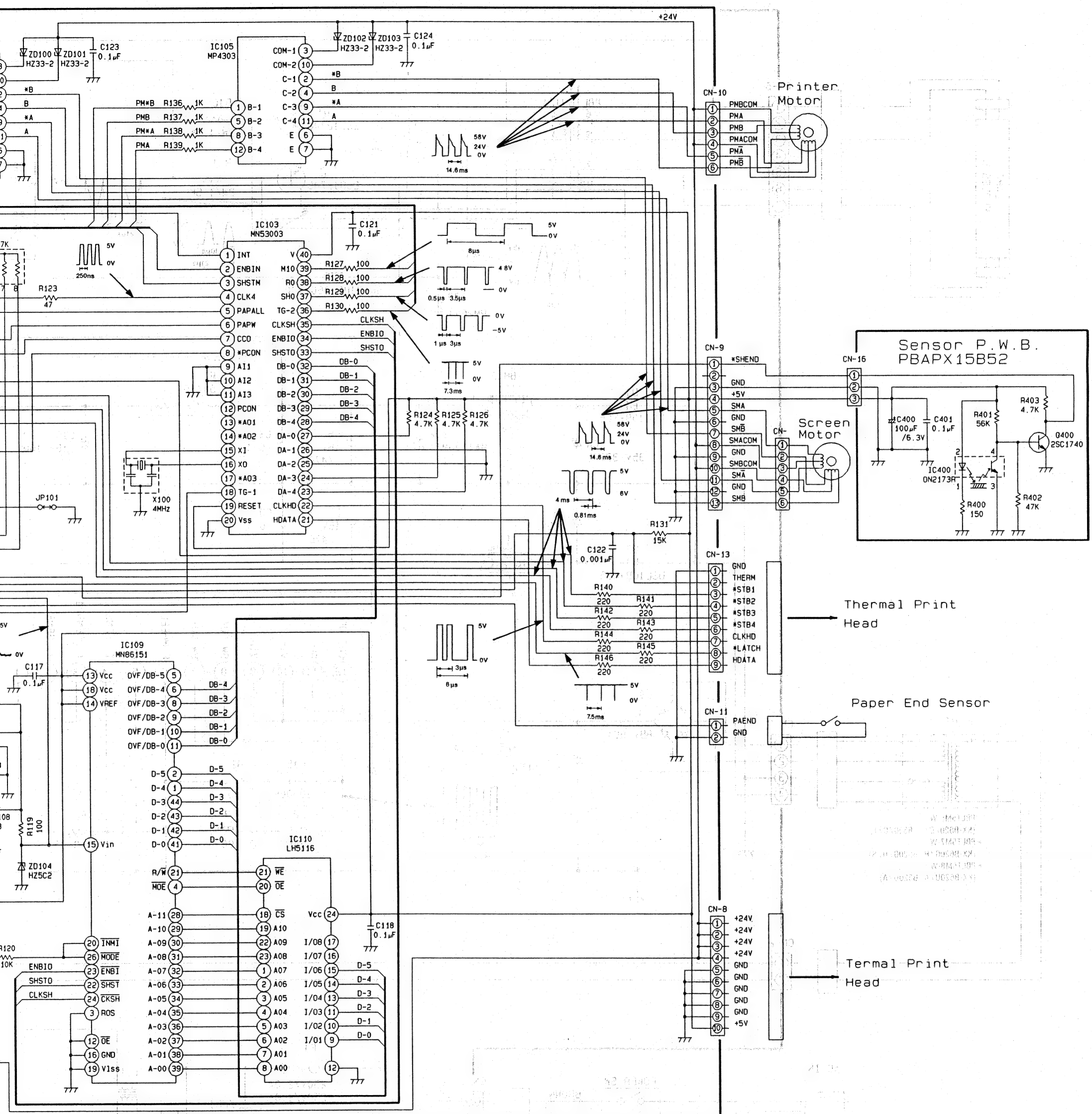
IC107
4066

CNTA (13)
C1 (9)
CNTD (12)
CNTB (5)
CNTC (6)
A1 (1)

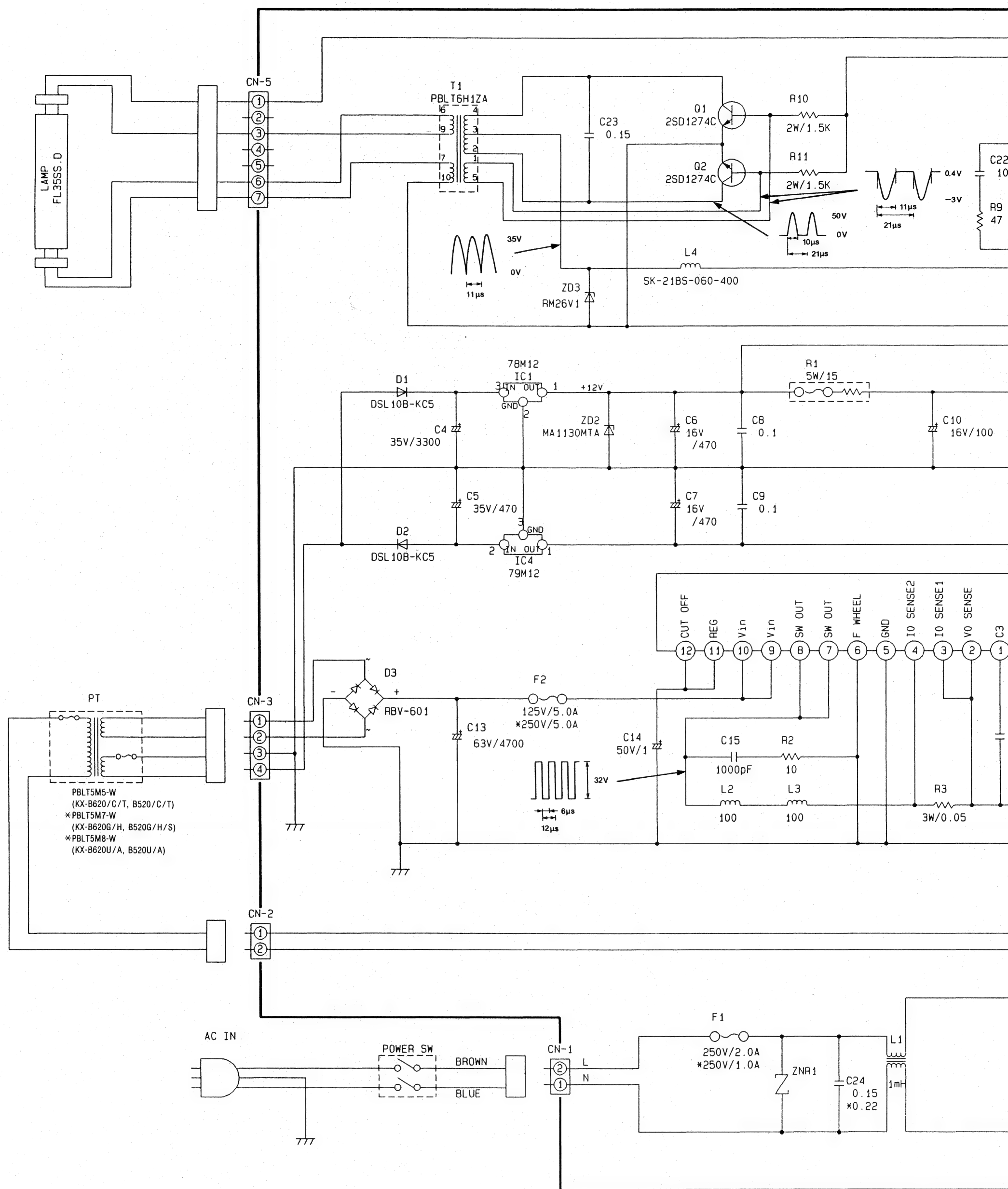
IC108
318

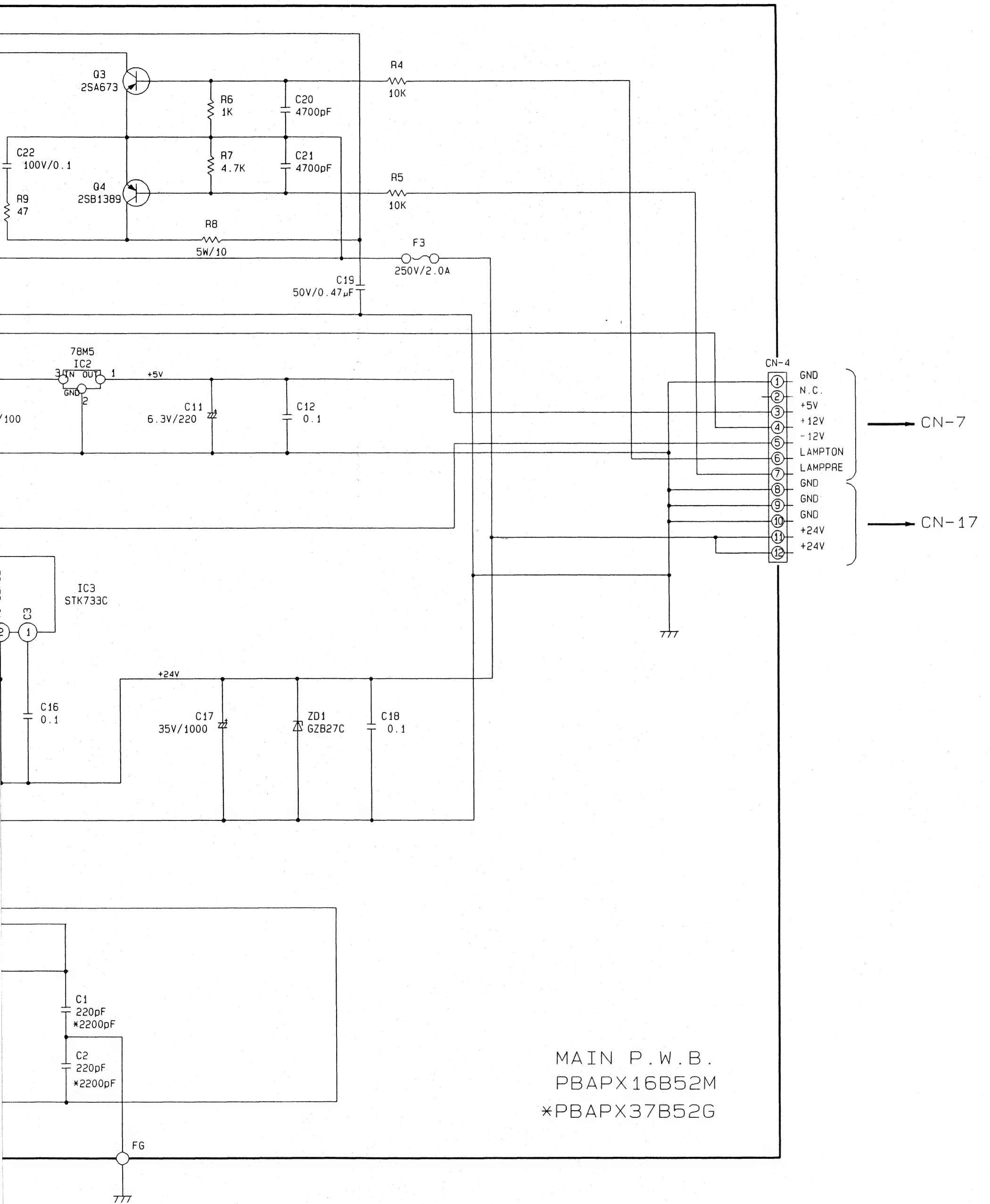
Panel P.W.B.
PBAPX14B52

C300 (0.1μF)
SW301 (COPY)
SW300 (FEED)
D301 (GREEN) (POWER LED)
R301 (270)
D300 (RED) (POWER END LED)
R302 (270)



the power source 220-240V.





15. CIRCUIT BOARD

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|------|-----|-----------------------|
| 1 | +24V | +24V | | DC +24V |
| 2 | +24V | +24V | | DC +24V |
| 3 | +24V | +24V | | DC +24V |
| 4 | +24V | +24V | | DC +24V |
| 5 | GND | 0V | | Ground |
| 6 | GND | 0V | | Ground |
| 7 | GND | 0V | | Ground |
| 8 | GND | 0V | | Ground |
| 9 | GND | 0V | | Ground |
| 10 | +5V | +5V | | DC +5V |

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|------|-----|-----------------------|
| 1 | GND | 0V | | Ground |
| 2 | GND | 0V | | Ground |
| 3 | +24V | +24V | | DC +24V |
| 4 | +24V | +24V | | DC +24V |

| No | Signal Name | On | Off |
|----|-------------|------|-----|
| 1 | GND | 0V | |
| 2 | +5V | +5V | |
| 3 | +12V | +12V | |
| 4 | -12V | -12V | |
| 5 | LAMPION | 0V | 24V |
| 6 | LAMPPRE | 0V | 24V |
| 7 | GND | 0V | |

| No | Signal Name | On | Off | Description of Signal |
|----|--------------|-------|-----|-----------------------|
| 1 | *SHEND | 0V | +5V | Screen sensor signal |
| 2 | N.C. | — | | Non connection |
| 3 | GND | 0V | | Ground |
| 4 | +5V | +5V | | DC +5V |
| 5 | SMA | Pulse | | Motor drive signal |
| 6 | GND | 0V | | Ground |
| 7 | SM \bar{B} | Pulse | | Motor drive signal |
| 8 | SMACOM | +24V | | Drive power supply |
| 9 | GND | 0V | | Ground |
| 10 | SMBCOM | +24V | | Drive power supply |
| 11 | SM \bar{A} | Pulse | | Motor drive signal |
| 12 | GND | 0V | | Ground |
| 13 | SMB | Pulse | | Motor drive signal |

| No | Signal Name | On | Off | Description of Signal |
|----|--------------------|-------|-----|-----------------------|
| 1 | PMB _{COM} | +24V | | Drive power supply |
| 2 | PMA | Pulse | | Motor drive signal |
| 3 | PMB | Pulse | | Motor drive signal |
| 4 | PMACOM | +24V | | Drive power supply |
| 5 | PM \bar{A} | Pulse | | Motor drive signal |
| 6 | PM \bar{B} | Pulse | | Motor drive signal |

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|-----|-----|-----------------------|
| 1 | PAEND | +5V | 0V | Paper sensor signal |
| 2 | GND | 0V | | Ground |

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|--------|-----|------------------------|
| 1 | GND | 0V | | Ground |
| 2 | COPY | +5V | 0V | Print key input signal |
| 3 | FEED | +5V | 0V | Feed key input signal |
| 4 | +5V | DC +5V | | |
| 5 | ENDLED | 0V | ≈3V | Paper end signal |

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|--------|-----|-----------------------|
| 1 | FILAMENT | 1V | | AC 1V |
| 2 | N.C. | — | | Non connection |
| 3 | FILAMENT | 1V | | AC 1V |
| 4 | N.C. | — | | Non connection |
| 5 | N.C. | — | | Non connection |
| 6 | FILAMENT | ≈ 100V | | AC 100V |
| 7 | FILAMENT | ≈ 100V | | AC 100V |

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|------|-----|-----------------------|
| 1 | GND | 0V | | Ground |
| 2 | N.C. | — | | Non connection |
| 3 | +5V | +5V | | DC +5V |
| 4 | +12V | +12V | | DC +12V |
| 5 | -12V | -12V | | DC -12V |
| 6 | TON | 24V | 0V | Lamp turn on signal |
| 7 | PRE | 24V | 0V | Lamp preheats signal |
| 8 | GND | 0V | | Ground |
| 9 | GND | 0V | | Ground |
| 10 | GND | 0V | | Ground |
| 11 | +24V | +24V | | DC +24V |
| 12 | +24V | +24V | | DC +24V |

| No | Signal Name | Description of Signal |
|----|-------------|-----------------------|
| 1 | N | AC 120V, 60Hz |
| | | AC 110V, 60Hz |
| | | AC 220-230V, 50/60Hz |
| | | AC 230-240V, 50Hz |
| 2 | L | AC 120V, 60Hz |
| | | AC 110V, 60Hz |
| | | AC 220-230V, 50/60Hz |
| | | AC 230-240V, 50Hz |

| No | Signal Name | On | Off |
|----|-------------|-----|-----|
| 1 | sec. 1 | 34V | |
| 2 | sec. 1 | 34V | |
| 3 | sec. 2 | 18V | |
| 4 | sec. 2 | 18V | |

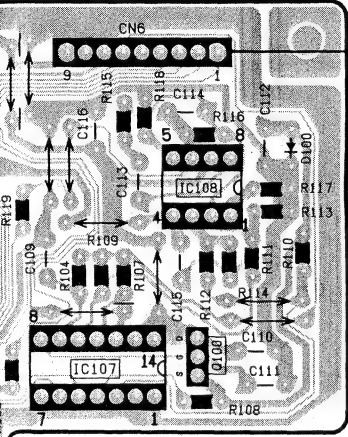
| | |
|----|-----------------|
| | Ratings of Fuse |
| *1 | T2. 0A, L, 250V |
| | T1. 0A, H, 250V |
| *2 | F5. 0A, L, 125V |
| | F5. 0A, L, 250V |

| No | Signal Name | D |
|----|-------------|-------------|
| 1 | N | AC 120V |
| | | AC 110V |
| | | AC 220-240V |
| | | AC 230-240V |
| 2 | NC | AC 120V |
| | | AC 110V |
| | | AC 220-240V |
| | | AC 230-240V |

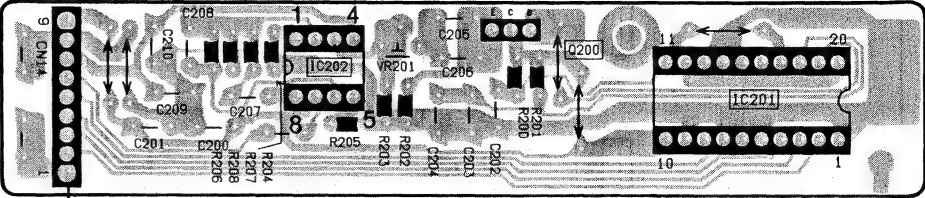
CN-6

| n | Off | Description of Signal |
|------|-----|-----------------------|
| 0V | | Ground |
| +5V | | DC +5V |
| +12V | | DC +12V |
| -12V | | DC -12V |
| V | 24V | Lamp turn on signal |
| V | 24V | Lamp preheats signal |
| 0V | | Ground |

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|-------|-----|------------------------|
| 1 | ENBI | Pulse | | CCD Data enable signal |
| 2 | φ 10 | Pulse | | CCD clock |
| 3 | φ R0 | Pulse | | Reset clock |
| 4 | φ SH0 | Pulse | | Sample-Hold clock |
| 5 | φ TG | Pulse | | Trigger clock |
| 6 | VIANA | 0-5V | | CCD output signal |
| 7 | -12V | -12V | | DC -12V |
| 8 | GND | 0V | | Ground |
| 9 | +12V | +12V | | DC +12V |



CCD BOARD



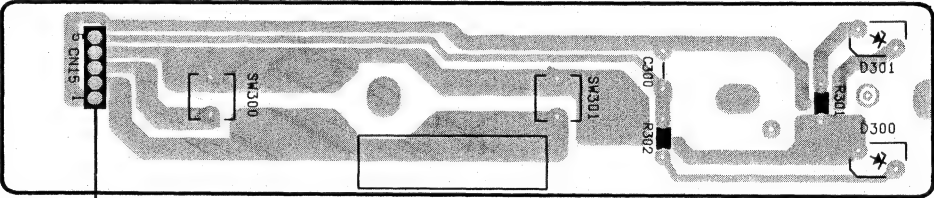
CN-14

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|-------|-----|------------------------|
| 1 | ENBI | Pulse | | CCD Data enable signal |
| 2 | φ 10 | Pulse | | CCD clock |
| 3 | φ R0 | Pulse | | Reset clock |
| 4 | φ SH0 | Pulse | | Sample-Hold clock |
| 5 | φ TG | Pulse | | Trigger clock |
| 6 | VIANA | 0-5V | | CCD output signal |
| 7 | -12V | -12V | | DC -12V |
| 8 | GND | 0V | | Ground |
| 9 | +12V | +12V | | DC +12V |

CN-13

| No | Signal Name | On | Off | Description of Signal |
|----|-------------|-------|-----|-----------------------|
| 1 | GND | 0V | | Ground |
| 2 | THERM | 0V-5V | | Thermistor signal |
| 3 | STB1 | Pulse | | Data strobe signal 1 |
| 4 | STB2 | Pulse | | Data strobe signal 2 |
| 5 | STB3 | Pulse | | Data strobe signal 3 |
| 6 | STB4 | Pulse | | Data strobe signal 4 |
| 7 | CLKHD | Pulse | | Head clock signal |
| 8 | LATCH | Pulse | | Head latch signal |
| 9 | HDATA | Pulse | | Head data |

PANEL BOARD



CN-15

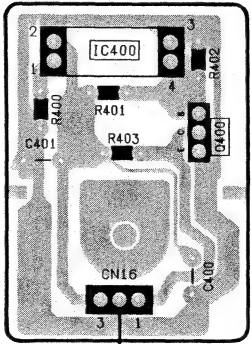
| No | Signal Name | On | Off | Description of Signal |
|----|-------------|-----|-----|------------------------|
| 1 | GND | 0V | | Ground |
| 2 | COPY | +5V | 0V | Print key input signal |
| 3 | FEED | +5V | 0V | Feed key input signal |
| 4 | +5V | +5V | | DC +5V |
| 5 | ENDLED | 0V | ≈3V | Paper end signal |

| n | Off | Description of Signal |
|-----|-----|-----------------------|
| 34V | | AC 34V |
| 34V | | AC 34V |
| 18V | | AC 18V |
| 18V | | AC 18V |

| of Fuse | Models |
|---------|-------------------------------------|
| 250V | KX-B620/C/T, KX-B520/C/T |
| 250V | KX-B620A/G/H/U, KX-B520A/G/H/S/U |
| 125V | KX-B620/C/T, KX-B520/C/T |
| 250V | KX-B620A/G/H/U, KX-B520A/G/H/S/U |

| Description of Signal |
|-----------------------|
| AC 120V, 60Hz |
| AC 110V, 60Hz |
| AC 220-230V, 50/60Hz |
| AC 230-240V, 50Hz |
| AC 120V, 60Hz |
| AC 110V, 60Hz |
| AC 220-230V, 50/60Hz |
| AC 230-240V, 50/60Hz |

SENSOR BOARD

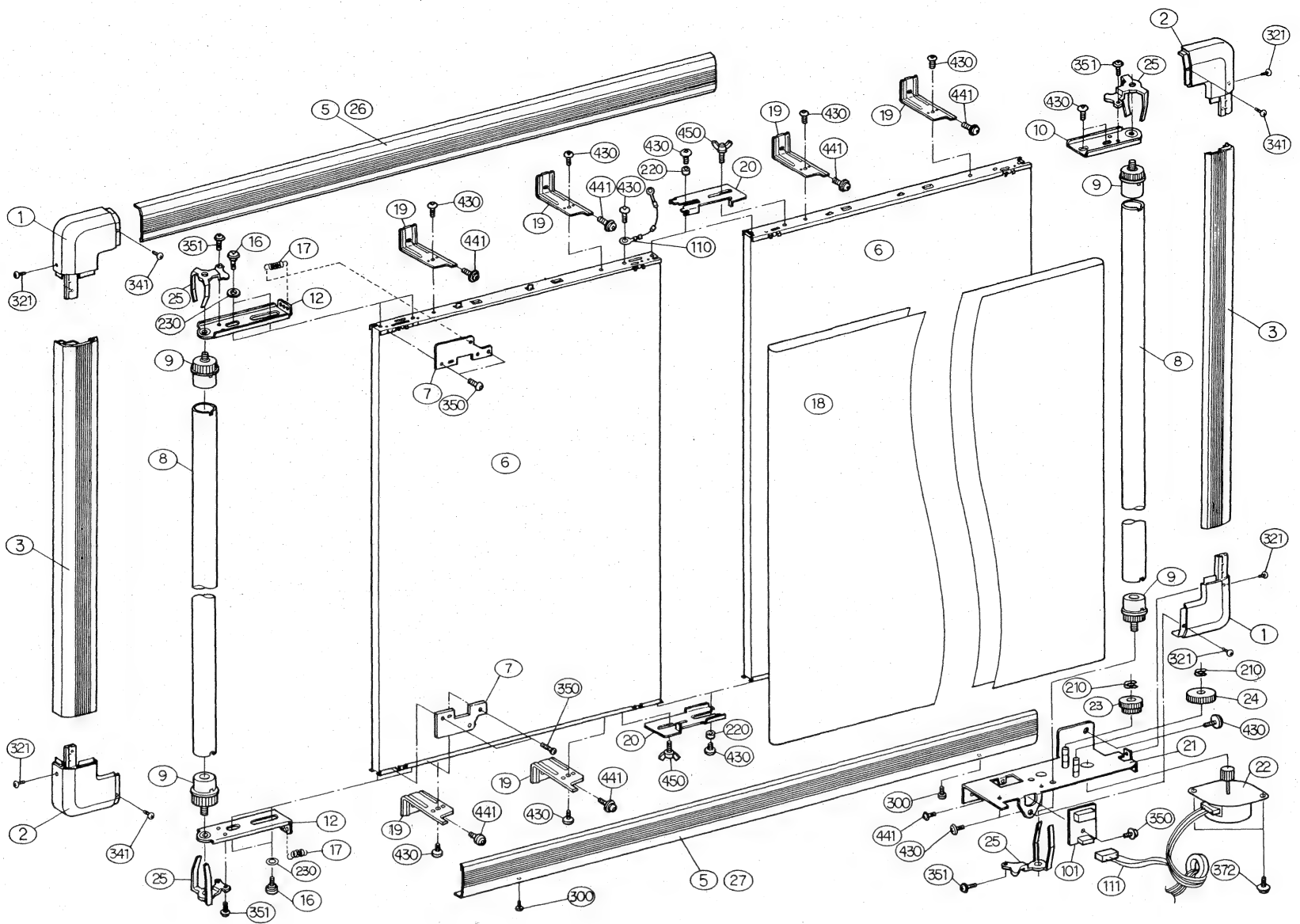


CN-16

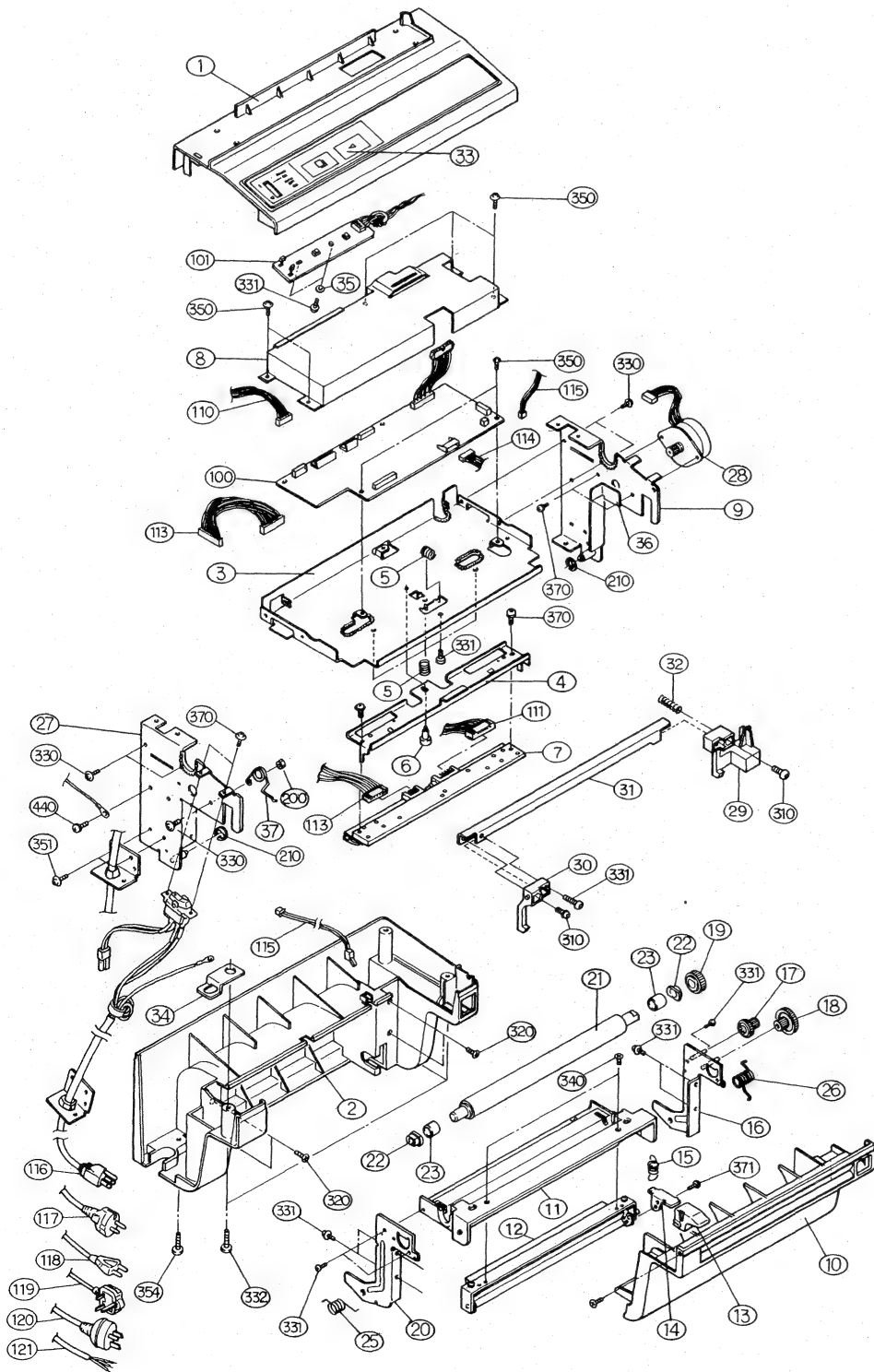
| No | Signal Name | On | Off | Description of Signal |
|----|-------------|-----|-----|-----------------------|
| 1 | *SHEND | 0V | +5V | Screen sensor signal |
| 2 | GND | 0V | | Ground |
| 3 | +5V | +5V | | DC +5V |

16. MECHANICAL PARTS LOCATION

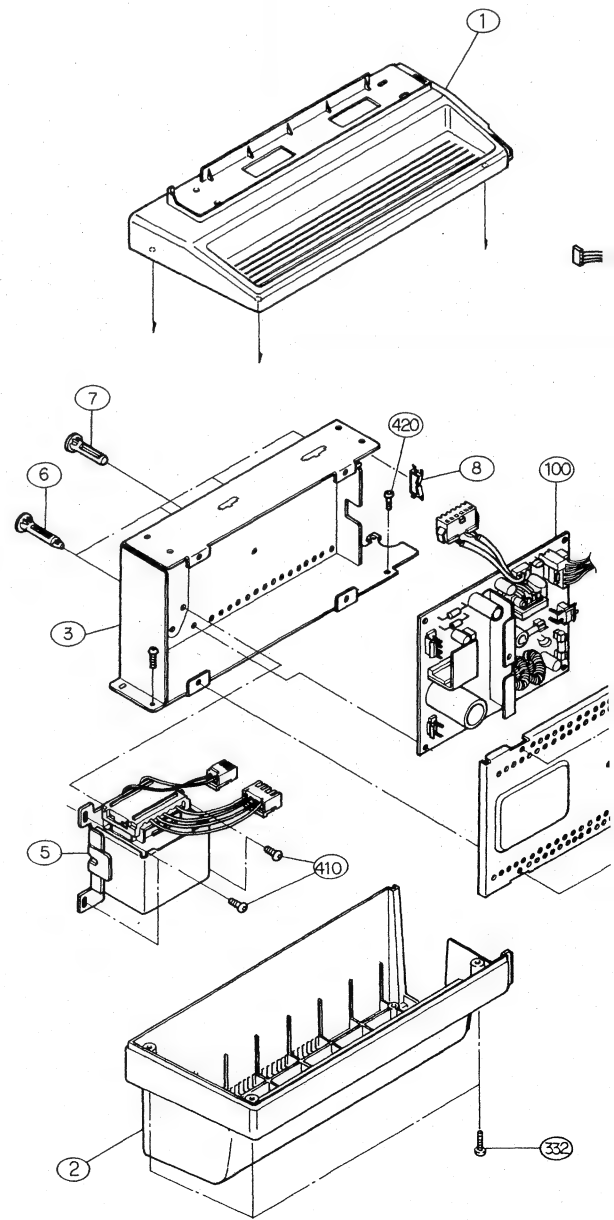
A



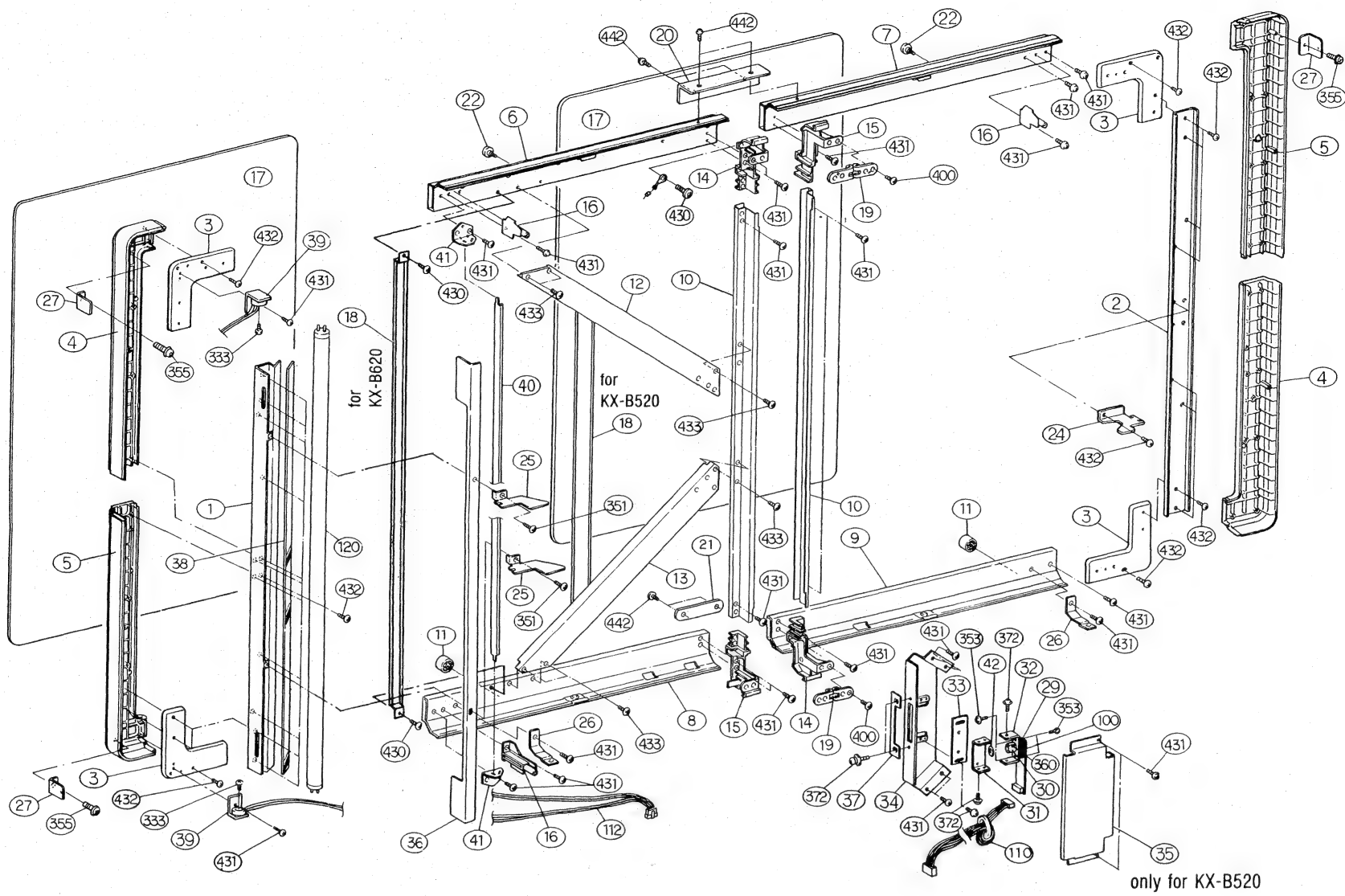
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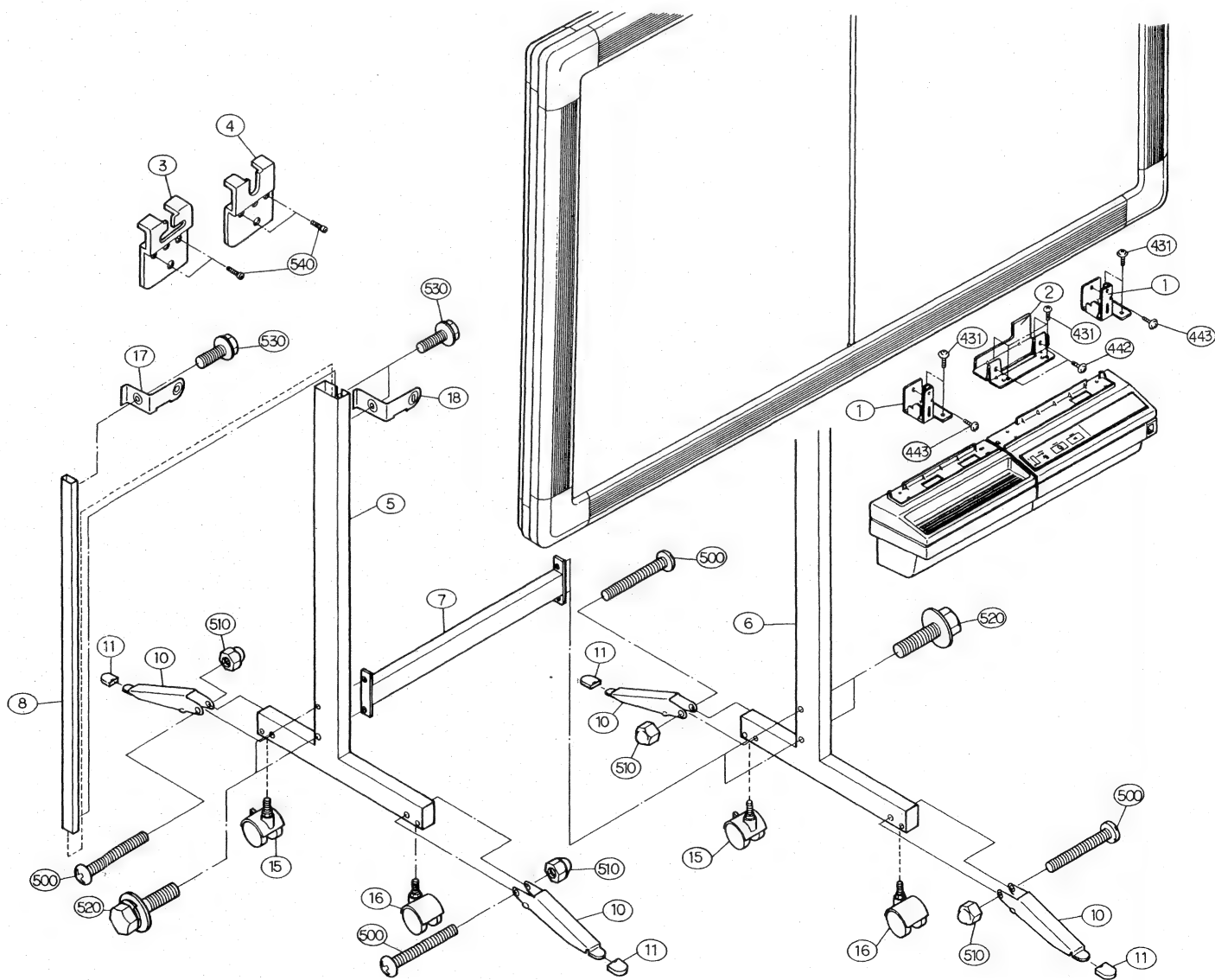
D



B



E



17. REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by the Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

NOTE:

- The marking (RTL) indicates that the Retention Time is Limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
- In KX-B520 Series, components that the Δ mark is indicated in the Q'ty column are used for only the product with the Δ mark on the nameplate.

1. Mechanical Parts

| Ref. No. | Part No. | Description | Q'ty | Ref. No. | Part No. | Description | Q'ty |
|----------|--------------|--|-------------|----------|--------------|--|-------------|
| (A) - 1 | PBGC1Z52 | Corner Frame Cover A Δ | 2 | (B) - 7 | PBKM4Z52-J | Frame B (KX-520 Series) | 1 |
| (A) - 2 | PBGC2Z52 | Corner Frame Cover B Δ | 2 | (B) - 8 | PBKMA0019Z-J | Frame C (KX-620 Series) | 1 |
| (A) - 3 | PBGC3Z52 | Frame Cover A Δ | 2 | (B) - 8 | PBKM19Z52-J | Frame C (KX-520 Series) | 1 |
| (A) - 5 | PBGC5Z52 | Frame Cover C Δ (KX-B520 Series) | 2 | (B) - 9 | PBKMA0020Z-J | Frame D (KX-620 Series) | 1 |
| (A) - 6 | PBUEA0031Z-J | Middle Plate Ass'y (KX-B620 Series) | 2 | (B) - 9 | PBKM20Z52-J | Frame D (KX-520 Series) | 1 |
| (A) - 6 | PBUE3Y52-J | Middle Plate Ass'y (KX-B520 Series) | 2, Δ | (B) - 10 | PBKMA0001Z52 | Frame E | 2 |
| (A) - 7 | PBULA0001Z52 | Bracket | 2, Δ | (B) - 11 | NF1U5552 | Foot | 2 |
| (A) - 8 | PBDR1Z52 | Roller | 2 | (B) - 12 | PBUA9Y | Support Frame A | 1 |
| (A) - 9 | PBUD1Y52 | Roller with Gear | 4, Δ | (B) - 13 | PBUA8Y | Support Frame B | 1 |
| (A) - 10 | PBMDA0001Z52 | Bracket A (Roller) | 1, Δ | (B) - 14 | PBUC3Z52 | Joint A | 2 |
| (A) - 12 | PBMD4Z740 | Bracket C (Roller) | 2, Δ | (B) - 15 | PBUC4Z52 | Joint B | 2 |
| (A) - 16 | PBHD3Z40 | Spacer Screw | 4, Δ | (B) - 16 | PBHR3Z52 | Bracket (Frame Cover) | 3 |
| (A) - 17 | PBDS10Z40 | Spring | 2, Δ | (B) - 17 | PBKUA0001Z | Rear Cover Δ | 2 |
| (A) - 18 | PBUEA0032Z-J | Screen (KX-B620 Series) Δ | 1 | (B) - 18 | PBBYA0005Z | Bracket (Rear Cover) (KX-620 Series) | 1 |
| (A) - 18 | PBUE2Z52-J | Screen (KX-B520 Series) Δ | 1 | (B) - 18 | PBBY2Z52-J | Bracket (Rear Cover) (KX-520 Series) | 1 |
| (A) - 19 | PBMDA0002Z52 | Bracket (Middle Plate Ass'y) | 7, Δ | (B) - 19 | PBBH1Z52 | Hinge | 2 |
| (A) - 20 | PBHMA0005Z52 | Bracket Slide | 2, Δ | (B) - 20 | PBHM6Z52 | Bracket (Frame Fixture (U)) | 1 |
| (A) - 21 | PBMMA0001Y | Bracket (Screen Feed Motor) (KX-B620 Series) | 1 | (B) - 21 | PBHM4Z52 | Bracket (Frame Fixture (L)) | 1 |
| (A) - 21 | PBMMA0001Z52 | Bracket (Screen Feed Motor) (KX-B520 Series) | 1, Δ | (B) - 22 | PBHD2Z52 | Wall Mounting Screw | 2 |
| (A) - 22 | PBAMA0004Z | Screen Feed Motor Δ (KX-B620 Series) | 1 | (B) - 24 | PBUL1Z52 | Bracket (Frame Cover (R)) | 1 |
| (A) - 22 | PBAMA0002Z52 | Screen Feed Motor Δ (KX-B520 Series) | 1, Δ | (B) - 25 | PBUL2Z52 | Bracket (Frame Cover (L)) | 2 |
| (A) - 23 | PBUD6Z52 | Idel Gear | 1 | (B) - 26 | PBMD24Z52 | Bracket (Frame Cover Fixture) | 2 |
| (A) - 24 | PBUD2Z52 | Idel Gear | 1 | (B) - 27 | PBUL3Z52 | Bracket (Corner Frame Cover) | 3 |
| (A) - 25 | PBHR26Z40 | Screen Holder | 4, Δ | (B) - 29 | PBHR1Z52 | Lens Holder | 1 |
| (A) - 26 | PBGCA0001Z | Frame Cover (upper) Δ (KX-B620 Series) | 1 | (B) - 30 | PBUE5Z52 | Lens | 1 |
| (A) - 27 | PBGCA0002Z | Frame Cover (lower) Δ (KX-B620 Series) | 1 | (B) - 31 | PBMD1Z52 | Bracket (Lens Unit Holder A) | 1 |
| | | | | (B) - 32 | PBMD2Z52 | Bracket (Lens Unit Holder B) | 1 |
| | | | | (B) - 33 | PBMD3Z52 | Bracket (Lens Unit Holder C) | 1 |
| (B) - 1 | PBUA1Z52-J | Bracket (Left Frame) | 1 | (B) - 34 | PBMDA0150Z | Bracket (Lens Unit Ass'y) (KX-620 Series) | 1 |
| (B) - 2 | PBUA6Z52 | Bracket (Right Frame) | 1 | (B) - 34 | PBMD4Z52 | Bracket (Lens Unit Ass'y) (KX-520 Series) | 1 |
| (B) - 3 | PBUA7Z52 | Bracket (Corner Frame) | 4 | (B) - 35 | PBMC4Z52 | Bracket (CCD Shield) (KX-520 Series only) | 1 |
| (B) - 4 | PBKM1Z52 | Corner Frame A Δ | 2 | (B) - 36 | PBMC5Z52 | Bracket (Lamp Shield) | 1 |
| (B) - 5 | PBKM2Z52 | Corner Frame B Δ | 2 | (B) - 37 | PBMZ1Z52 | Bracket (Light Interceptor) | 1 |
| (B) - 6 | PBKMA0017Z-J | Frame A (KX-620 Series) | 1 | (B) - 38 | PBUE1Z52 | Mirror | 1 |
| (B) - 6 | PBKMA0018Z-J | Frame A (KX-520 Series) | 1 | (B) - 39 | PBMK1Z52 | Bracket (Lamp Socket) | 2 |
| (B) - 7 | PBKMA0018Z-J | Frame B (KX-620 Series) | 1 | (B) - 40 | PBMZA0001Z52 | Reflector | 1, Δ |
| | | | | (B) - 41 | PBUHA0001Z52 | Bracket (Reflector) | 2, Δ |
| | | | | (B) - 42 | PBMZ2Z52 | Lens Shield | 1 |

KX-B620 Series
KX-B520 Series

| Ref. No. | Part No. | Description | Q'ty |
|----------|--------------|--|------|
| © - 1 | PBKM10Z-J | Printer Cover (Upper) Δ | 1 |
| © - 2 | PBKM11Z52 | Printer Cover (Lower) Δ | 1 |
| © - 3 | PBUA4Z52 | Chassis | 1 |
| © - 4 | PBMH1Z52 | Bracket (Printer Head) | 1 |
| © - 5 | PQUS176Y52 | Spring (Printer Head) | 5 |
| © - 6 | PQHD23Z52 | Screw (Printer Head) | 1 |
| © - 7 | PBEZ2Y40 | Printer Head Δ | 1, a |
| © - 8 | PBMC1Z52 | Shield Cover (Control Board) | 1 |
| © - 9 | PBUA10Z52 | Chassis (Right Ass'y) | 1 |
| © - 10 | PBKE1Z52-J | Printer Door Δ | 1 |
| © - 11 | PBUA5Z52-J | Printer Chassis | 1 |
| © - 12 | PBUE4Z52-J | Cutter | 1 |
| © - 13 | PBBS1Z52 | Cutter Lever | 1 |
| © - 14 | PBHM1Z52 | Bracket (Cutter) | 1 |
| © - 15 | PBDS2Z52 | Spring (Cutter) | 1 |
| © - 16 | PBUC10Z52 | Bracket (Printer Door (R) Ass'y) | 1 |
| © - 17 | PQDG5017Z52 | Gear A | 1 |
| © - 18 | PQDG5018Z52 | Gear B | 1 |
| © - 19 | PQDG5028Z52 | Gear C | 1 |
| © - 20 | PBUC2Z52 | Bracket (Printer Door (L) Ass'y) | 1 |
| © - 21 | PQDN13Z52 | Paper Feed Roller | 1 |
| © - 22 | XLL6Z52 | Bearings (1) | 2 |
| © - 23 | XLL7Z52 | Bearings (2) | 2 |
| © - 25 | PBDS1Z52 | Spring A (Printer Door) | 1 |
| © - 26 | PBDS4Z52 | Spring B (Printer Door) | 1 |
| © - 27 | PBUA11Z52 | Chassis (Left Ass'y) | 1 |
| © - 28 | PF4248C51052 | Paper Feed Motor Δ | 1 |
| © - 29 | PBBC1Z52 | Printer Door Button | 1 |
| © - 30 | PBHR5Z52 | Printer Door Lever | 1 |
| © - 31 | PBUB1Z52 | Bracket (Stopper) | 1 |
| © - 32 | PBDS3Z52 | Spring (Stopper) | 1 |
| © - 33 | PBGA0026Z | Control Panel Sheet Δ (KX-B620 Series) | 1 |
| © - 33 | PBGP1Z52 | Control Panel Sheet Δ (KX-B520 Series) | 1 |
| © - 34 | PBUL8Z52 | Bracket Reinforce | 1 |
| © - 35 | RW0CF79050Z | Washer | 2 |
| © - 36 | PBHM9Z52 | Gear Cover Bracket | 1 |
| © - 37 | PBDS6Z52 | Aid Lock Spring | 1 |
| © - 1 | PBKM8Z52-J | Tray (Upper) Δ | 1 |
| © - 2 | PBKM9Z52 | Tray (Lower) Δ | 1 |
| © - 3 | PBMCA0001Z52 | Shield Base (PSU) | 1, a |
| © - 4 | PBMCA0002Z52 | Shield Cover (PSU) | 1, a |
| © - 5 | PBLT5M5W52 | Transformer (KX-B520, C, T) (KX-B620, C, T) | 1, a |
| © - 5 | PBLT5M7W52 | Transformer (KX-B520G, H, S) (KX-B620G, H) | 1, a |
| © - 5 | PBLT5M8W52 | Transformer (KX-B520U, A) (KX-B620U, A) | 1, a |
| © - 6 | KGLS-14RF | Locking Card Spacer | 4, a |
| © - 7 | KGPS-14RF | Card Spacer | 1, a |
| © - 8 | EDS-1 | Edging Saddle | 1, a |
| © - 1 | PBMD19Z52-J | Bracket A (Printer) | 2 |
| © - 2 | PBMD20Z52 | Bracket B (Printer) | 1 |
| © - 3 | PBMD17Y52 | Fixture A (Wall Mounting) | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|----------|--------------|-----------------------------|------|
| © - 4 | PBMD18Y52 | Fixture B (Wall Mounting) | 1 |
| © - 5 | PBYL6Y52-J | Stand Base Ass'y (L) | 1 |
| © - 6 | PBYL12Y52-J | Stand Base Ass'y (R) | 1 |
| © - 7 | PBYL8Y52 | Panel Support | 1 |
| © - 8 | PBYL7Y52 | Prop Upper Ass'y | 2 |
| © - 10 | PBYL9Z52 | Tiptoe Extension ※ | 4 |
| © - 11 | PBKL4Z52 | Tiptoe Cover ※ | 4 |
| © - 15 | P42TSM815B52 | Caster (Lock) | 2 |
| © - 16 | P42TM815B52 | Caster | 2 |
| © - 17 | PBHMA0001Z52 | Bracket A | 2 |
| © - 18 | PBHMA0002Z52 | Bracket B | 2 |
| | PBBYA0001Z52 | Joint Bracket (For Packing) | 1 |
| | PBHPA0001Z52 | Fold Up Roller | 2 |

※ These components are used for KX-B06CS
(Optional Stand) only.

2. Screw and Other Parts

| Ref. No. | Part No. | Description | Q'ty |
|----------|-------------|------------------|------|
| 200 | XNT3EFX | Nut M3 | |
| 210 | XUC4FY | E Ring M4 | |
| 220 | MWSP4-20 | Spacer M4 | |
| 230 | RWPS7-025 | Washer | |
| 300 | XTP3+8FXS | Screw M3 × 8 | |
| 310 | XSN3+4FX | Screw M3 × 4 | |
| 320 | XSS3+6FXS | Screw M3 × 6 | |
| 321 | XSS3+12FYS | Screw M3 × 12 | |
| 330 | XTN3+6FFX | Screw M3 × 6 | |
| 331 | XTN3+10JFX | Screw M3 × 10 | |
| 332 | XTN3+12JFX | Screw M3 × 12 | |
| 333 | XTN3+14JFX | Screw M3 × 14 | |
| 340 | XTS3+6FFX | Screw M3 × 6 | |
| 341 | XTS3+12CFX | Screw M3 × 12 | |
| 350 | XTW3+6LFX | Screw M3 × 6 | |
| 351 | XTW3+8LFX | Screw M3 × 8 | |
| 352 | XTW3+10SFX | Screw M3 × 10 | |
| 353 | XTW3+W8SFX | Screw M3 × 8 | |
| 354 | XTW3+10LFX | Screw M3 × 10 | |
| 355 | XTW3+12SFX | Screw M3 × 12 | |
| 360 | XXE3D5FPS | Screw M3 × 5 | |
| 370 | XYN3+C5FX | Screw M3 × 5 | |
| 371 | XYN3+C10FX | Screw M3 × 10 | |
| 372 | XYN3+F6FX | Screw M3 × 6 | |
| 400 | XSS4+8FXS | Screw M4 × 8 | |
| 410 | XTB4+6FFY | Screw M4 × 6 | |
| 420 | XTN4+12JFX | Screw M4 × 12 | |
| 430 | XTT4+8FFY | Screw M4 × 8 | |
| 431 | XTT4+10FFY | Screw M4 × 10 | |
| 432 | XTT4+10JFX | Screw M4 × 10 | |
| 433 | XTT4+18FFX | Screw M4 × 18 | |
| 440 | XYN4+C8FX | Screw M4 × 8 | |
| 441 | XYN4+F10FXS | Screw M4 × 10 | |
| 442 | XYN4+F12FXS | Screw M4 × 12 | |
| 443 | XYN4+F20FXS | Screw M4 × 20 | |
| 450 | XVP4F6FX | Wing bolt M4 × 6 | |
| 500 | XSN6+40FY | Screw M6 × 40 | |
| 510 | XNA6DFY | Nut M6 | |
| 520 | XVG8BF40FY | Screw M8 × 40 | |
| 530 | XVG6BF20FY | Screw M6 × 20 | |
| 540 | XSN6+20FYS | Screw M6 × 20 | |

3. Control Board

| Ref. No. | Part No. | Description | Q'ty |
|--|-------------|--|---------------|
| © - 100 | PBAPX12B52 | Control PCB Ass'y (RTL) (KX-B520, C) (KX-B620, C) | 1, Δ a |
| © - 100 | PBAPX12B52G | Control PCB Ass'y (RTL) (KX-B520A, G, H, S, T, U) (KX-B620A, G, H, T, U) | 1, Δ a |
| R119, R127 - 130 | ERDS2TJ101 | Resistor 100 | 5 |
| R102 , 103 R132 - 139 | ERDS2TJ102 | Resistor 1k | 10 |
| R100 , 101 R104 - 106 R120 | ERDS2TJ103 | Resistor 10k | 6 |
| R121 | ERDS2TJ122 | Resistor 1.2k | 1 |
| R109 , 110 | ERDS2TJ123 | Resistor 12k | 2 |
| R111 , 112 R114 , 131 | ERDS2TJ153 | Resistor 15k | 4 |
| R118 | ERDS2TJ183 | Resistor 18k | 1 |
| R140 - 146 | ERDS2TJ221 | Resistor 220 | 7 |
| R113 , 116 R117 , 122 | ERDS2TJ273 | Resistor 27k | 4 |
| R115 | ERDS2TJ332 | Resistor 3.3k | 1 |
| R107 , 108 | ERDS2TJ392 | Resistor 3.9k | 2 |
| R123 | ERDS2TJ470 | Resistor 47 | 1 |
| R124 - 126 | ERDS2TJ472 | Resistor 4.7k | 3 |
| Z1 , Z2 | Z11E472J | Resistor Arry 4.7k | 2 |
| Z3 | Z8E472J | Resistor Arry 4.7k | 1 |
| JP101 | PPJJ-10M | Jumper (A4 only) | 1 |
| C114 | ECCW1H050CC | Capacitor 5pF | 1 |
| C109 , 113 C122 | ECKW1H102KB | Capacitor 1000pF | 3 |
| C101 , 103 C105 , 107 C110 , 112 C115 , 116 C118 , 119 C123 - 126 | ECFW1H104ZF | Capacitor 0.1 μ F | 14 |
| C117 , 120 C121 | RPE132F104 | Capacitor 0.1 μ F | 3 |
| C111 | ECQP1472JZ | Capacitor 4700pF | 1 |
| C100 | ECEA0JU221 | Capacitor 220 μ F | 1 |
| C102 , 104 | ECEA1CU221 | Capacitor 220 μ F | 2 |
| C106 | ECEA1VU221 | Capacitor 220 μ F | 1 |
| C108 | ECEA1HU010 | Capacitor 1 μ F | 1 |
| D100 | E-102RE | Diode | 1 |
| ZD104 | HZ5C2 | Diode (Zener) | 1 |
| ZD100 - 103 | HZ33-2 | Diode (Zener) | 4 |
| Q100 | 2SK369 | Transistor | 1 |
| IC106 | HD7407P | IC (TTL Normal) | 1 |
| IC109 | MN86151 | IC (Shading Corrector) | 1 |
| IC103 | MN53003QPQ | IC (Gate Array) | 1 |
| IC104 , 105 | MP4303 | Transistor Array | 2 |
| IC110 | LH5116D | IC (SRAM) | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|----------|--------------|-------------------|------------------------|
| IC108 | NJM318D | IC (OP AMP) | 1 |
| IC107 | MC14066BCP | IC (Analog SW) | 1 |
| IC101 | PBM51953BL | IC (RESET) | 1 |
| IC102 | PBM50727-750 | IC (CPU) | 1 |
| X100 | CST4.00MGW | Oscillator | 1 |
| | PAUX37802 | Earth Terminal | 1 |
| FB1 | PBB01 | Beaded Core | 1 |
| CN6 | B9B-XH | Connector | 1 |
| CN7 | B7P-VH | Connector | Δ 1 |
| CN8 | ILS10P | Connector | Δ 1 |
| CN9 | PBJE3Y52 | Motor Relay Cable | Δ 1, Δ a |
| CN10 | B6B-XH | Connector | Δ 1 |
| CN11 | B2B-XH | Connector | Δ 1 |
| CN12 | PI22BA05M | Connector | Δ 1 |
| CN13 | ILS9P | Connector | Δ 1 |
| CN17 | B4P-VH | Connector | Δ 1 |

4. CCD Board

| Ref. No. | Part No. | Description | Q'ty |
|--------------------------|-------------|------------------------|------------------------|
| ② - 100 | PBAPX13B52 | CCD PCB Ass'y (RTL) | Δ 1, Δ a |
| R202 , 203 | ERDS2TJ102 | Resistor 1k | 2 |
| R204 | ERDS2TJ822 | Resistor 8.2k | 1 |
| R200 | ERDS2TJ123 | Resistor 12k | 1 |
| R208 | ERDS2TJ152 | Resistor 1.5k | 1 |
| R206 | ERDS2TJ153 | Resistor 15k | 1 |
| R205 | ERDS2TJ183 | Resistor 18k | 1 |
| R201 | ERDS2TJ330 | Resistor 33 | 1 |
| R207 | ERDS2TJ332 | Resistor 3.3k | 1 |
| VR201 | DCAA03B53 | Resistor 5k | 1 |
| C200 , 204 C209 | ECEA1CU470 | Capacitor 47 μ F | 3 |
| C206 | ECEA1CU101 | Capacitor 100 μ F | 1 |
| C208 | ECCW1H050CC | Capacitor 5pF | 1 |
| C205 | ECFW1H103KB | Capacitor 0.01 μ F | 1 |
| C201 - 203 C207 , 210 | ECFW1H104ZF | Capacitor 0.1 μ F | 5 |
| IC201 | UPD3575D | IC (CCD) | 1 |
| IC202 | NJM318D | IC (OP AMP) | 1 |
| Q200 | 2SC1740S | Transistor | 1 |
| CN14 | B9B-XH | Connector | Δ 1 |
| ④ | PBHR24Z40 | CCD Spacer | 1 |

KX-B620 Series **KX-B520 Series**

5. Operation Panel and Sensor Board

| Ref. No. | Part No. | Description | Q'ty |
|-------------|-------------|--------------------------------------|--------|
| © - 101 | PBAPX14B52 | Panel PCB Ass'y (RTL) Δ | 1, [a] |
| R301 , 302 | ERDS2TJ271 | Resistor 270 | 2 |
| C300 | RPE132F104 | Capacitor 0.1 μ F | 1 |
| D300 | LN220RP | LED (RED) | 1 |
| D301 | LN320GP | LED (GREEN) | 1 |
| SW300 , 301 | EVQ-21405R | Switch | 2 |
| CN16 | PBJE9Y52 | Connector with Cable Panel Δ | 1, [a] |
| Ⓐ - 101 | PBAPX15B52 | Sensor PCB Ass'y (RTL) Δ | 1, [a] |
| R400 | ERDS2TJ151 | Resistor 150 | 1 |
| R403 | ERDS2TJ472 | Resistor 4.7k | 1 |
| R402 | ERDS2TJ473 | Resistor 47k | 1 |
| R401 | ERDS2TJ563 | Resistor 56k | 1 |
| C400 | ECEA0JKA101 | Capacitor 100 μ F | 1 |
| C401 | RPE132F104 | Capacitor 0.1 μ F | 1 |
| Q400 | 2SC1740S | Transistor | 1 |
| IC400 | 0N2173-R | IC (Photo Sensor) | 1 |
| CN16 | B3B-XH | Connector with Cable Sensor Δ | 1 |

6. Main Board

| Ref. No. | Part No. | Description | Q'ty |
|----------|-------------|--|--------|
| Ⓒ - 100 | PBAPX16B52M | Power Supply PCB Ass'y (RTL) (KX-B520, C, T) Δ | 1, [a] |
| Ⓒ - 100 | PBAPX37B52G | Power Supply PCB Ass'y (RTL) (KX-B520A, G, H, S, U) (KX-B620A, G, H, U) Δ | 1, [a] |
| R3 | MPC75005 | Resistor 0.05 | 1 |
| R2 | ERD25TJ100 | Resistor 10 | 1 |
| R6 | ERD25TJ102 | Resistor 1k | 1 |
| R8 | ERF5TJ100 | Resistor 10 | 1 |
| R4 , 5 | ERD25TJ103 | Resistor 10k | 2 |
| R7 | ERD25TJ472 | Resistor 4.7k | 1 |
| R9 | ERD25TJ470 | Resistor 47 | 1 |
| R10 , 11 | ERG2SJ152 | Resistor 1.5k | 2 |
| R1 | ERU5TAJ150 | Resistor 15 Δ | 1 |
| C13 | ECOS1JG472 | Capacitor 4700 μ F | 1 |
| C17 | ECEA1VU102 | Capacitor 1000 μ F | 1 |
| C14 | ECEA1HGE010 | Capacitor 1 μ F | 1 |
| C4 | ECEA1VGE332 | Capacitor 3300 μ F | 1 |
| C5 | ECEA1VGE471 | Capacitor 470 μ F | 1 |
| C6 , 7 | ECEA1CGE471 | Capacitor 470 μ F | 2 |

| Ref. No. | Part No. | Description | Q'ty |
|----------|--------------|--|--------|
| C11 | ECEA0JGE221 | Capacitor 220 μ F | 1 |
| C10 | ECEA1CGE101 | Capacitor 100 μ F | 1 |
| C1 , 2 | ECKDRS221ME | Capacitor 220pF (KX-B520, C, T) Δ | 2 |
| C1 , 2 | ECKDRS222ME | Capacitor 2200pF (KX-B520A, G, H, S, U) (KX-B620A, G, H, U) Δ | 2 |
| C15 | ECQP1102JZ | Capacitor 1000pF | 1 |
| C8 , 9 | ECFW1H104ZF | Capacitor 0.1 μ F | 3 |
| C23 | ECQF4154J | Capacitor 0.15 μ F | 1 |
| C19 | ECQV1H474 | Capacitor 0.47 μ F | 1 |
| C20 , 21 | ECQB1H472 | Capacitor 4700pF | 2 |
| C22 | ECQE1104 | Capacitor 0.1 μ F | 1 |
| C24 | ECQU2A154M | Capacitor 0.15 μ F (KX-B520, C, T) (KX-B620, C, T) Δ | 1, [a] |
| C24 | ECQU2A224M | Capacitor 0.22 μ F (KX-B520A, G, H, S, U) (KX-B620A, G, H, U) Δ | 1, [a] |
| C3 | ECQU2A104M | Capacitor 0.1 μ F Δ | 1 |
| C16 , 18 | RPE132F104 | Capacitor 0.1 μ F | 2 |
| IC3 | STK733C | IC | 1 |
| IC4 | NJM79M12FA | IC (Regulator) | 1 |
| IC2 | NJM78MP5F | IC (Regulator) | 1 |
| IC1 | NJM78M12 | IC (Regulator) | 1 |
| Q1 , 2 | 2SD1274C | Transistor | 2 |
| Q3 | 2SA673AC | Transistor | 1 |
| Q4 | 2SB1389 | Transistor | 1 |
| D1 , 2 | DSL10B-KC8 | Diode | 2 |
| D3 | RBV601 | Diode | 1, [a] |
| ZD1 | GZB27C | Diode (Zener) | 1 |
| ZD2 | MA1130MTA | Diode (Zener) | 1 |
| ZD3 | RM26V1 | Diode (Zener) | 1 |
| L1 | FK060E1020 | Coil Δ | 1 |
| L2 , 3 | SK12M5Y | Coil | 2 |
| L4 | SK21BS060X | Coil | 1 |
| T1 | PBLT6H1ZA | Transformer | 1 |
| F1 | PBXB239002Z4 | Fuse 250V 2A (KX-B520, C, T) Δ (KX-B620, C, T) | 1 |
| F1 | PBXB215001Z4 | Fuse 250V 1A (KX-B520A, G, H, S, U) (KX-B620A, G, H, U) Δ | 1 |
| F2 | PBXB235005Z4 | Fuse 125V 5A (KX-B520, C, T) Δ (KX-B620, C, T) | 1 |
| F2 | PBXB217005Z4 | Fuse 250V 5A (KX-B520A, G, H, S, U) (KX-B620A, G, H, U) Δ | 1 |
| F3 | PBXB235002Z4 | Fuse 250V 2A (KX-B520, C, T) Δ (KX-B620, C, T) | 1 |
| F3 | PBXB217002Z4 | Fuse 250V 2A (KX-B520A, G, H, S, U) (KX-B620A, G, H, U) Δ | 1 |

| Ref. No. | Part No. | Description | Q'ty |
|----------|-------------|---|------|
| ZNR1 | C10DK271U | Varistor (KX-B520, C, T) (KX-B620, C, T) | 1 |
| ZNR1 | C10DK431U | Varistor (KX-B520A, G, H, S, U) (KX-B620A, G, H, U) | 1 |
| ① | PBAGA0001ZA | Heatsink A (IC) | 1, a |
| ② | TJC6320 | Fuse Holder | 6, a |
| | PBMY4Z52 | Heatsink (D3) | 1 |
| FG | PBJE27Z40 | Cable FG | 1 |
| CN1 | B2P3S-VH | Connector | 1, a |
| CN2 | B2P3-VH | Connector | 1 |
| CN3 | B4P-VH | Connector | 1 |
| CN4 | PBJE7YA | Connector with Cable | 1, a |
| CN5 | PBJE5YA | Cable | 1, a |
| | TKK179484 | Ground Terminal | 1 |

7. Cable

| Ref. No. | Part No. | Description | Q'ty |
|----------|------------|---|------|
| Ⓐ - 110 | PBJE17Z52 | Core with Terminal | 1 |
| Ⓑ - 110 | PBJEA0165Z | Cable (CCD Sensor) (KX-B620 Series) | 1 |
| Ⓑ - 110 | PBJE6Y52 | Cable (CCD Sensor) (KX-B520 Series) | 1, a |
| Ⓐ - 111 | PBJEA0164Z | Cable (Home Position Sensor) (KX-B620 Series) | 1 |
| Ⓐ - 111 | PBJE10Y52 | Cable (Home Position Sensor) (KX-B520 Series) | 1, a |
| Ⓑ - 112 | PBJEA0163Z | Cable (Fluorescent Lamp Socket) (KX-B620 Series) | 1 |
| Ⓑ - 112 | PBJE12Y52 | Cable (Fluorescent Lamp Socket) (KX-B520 Series) | 1 |
| Ⓑ - 120 | FL35SS-D | Fluorescent Lamp | 1 |
| Ⓒ - 110 | PBJE1Y52 | Cable (CN6-CCD Sensor Cable) | 1, a |
| Ⓒ - 113 | PBJE2Y52 | Cable (Printer Head Power) | 1 |
| Ⓒ - 113 | PBJE4Y52 | Cable (Printer Head Signal) | 1 |
| Ⓒ - 115 | PBJE11Z52 | Cable (Paper End Sensor) | 1 |
| Ⓒ - 116 | PBWA1Y52 | Power Supply Cord Ass'y (For U. S. A.) | 1, a |
| Ⓒ - 117 | PBWA2Y52 | Power Supply Cord Ass'y (For Germany) | 1, a |
| Ⓒ - 118 | PBWA5X52 | Power Supply Cord Ass'y (For Hong Kong) | 1, a |
| Ⓒ - 119 | PBWA4Y52 | Power Supply Cord Ass'y (For England) | 1, a |
| Ⓒ - 120 | PBWA6Y52 | Power Supply Cord Ass'y (For Australia, New Zealand) | 1, a |
| Ⓒ - 121 | PBWA7Y52 | Power Supply Cord Ass'y (For Switzerland) | 1, a |

8. Packing Parts

| Ref. No. | Part No. | Description | Q'ty |
|----------|-------------|---|------|
| | PBPGA0085Z | Carton (KX-B620 Series) | 1 |
| | PBPGA0009Z | Carton (KX-B520/A/C/H/S/T/U) | 1 |
| | PBPGA0010Z | Carton (KX-B520G) | 1 |
| | PBPGA0084Z | Bottom Carton (KX-B620 Series) | 1 |
| | PBPGA0007Z | Bottom Carton (KX-B520 Series) | 1 |
| | HP-460WS | Speed Clip (KX-B620 Series) | 6 |
| | HP-601W | Speed Clip (KX-B520 Series) | 6 |
| | PBPQA0038Z | Cushion (upper left) (KX-B620 Series) | 1 |
| | PBPQA0004Z | Cushion (upper left) (KX-B520 Series) | 1 |
| | PBPQA0040Z | Cushion (upper center) (KX-B620 Series) | 1 |
| | PBPQA0006Z | Cushion (upper center) (KX-B520 Series) | 1 |
| | PBPQA0039Z | Cushion (upper right) (KX-B620 Series) | 1 |
| | PBPQA0003Z | Cushion (upper right) (KX-B520 Series) | 1 |
| | PBPQA0036Z | Cushion (lower left) (KX-B620 Series) | 1 |
| | PBPQA0002Z | Cushion (lower left) (KX-B520 Series) | 1 |
| | PBPQA0037Z | Cushion (lower right) (KX-B620 Series) | 1 |
| | PBPQA0001Z | Cushion (lower right) (KX-B520 Series) | 1 |
| | PBPPA0007Z | Cover for the unit (KX-B620 Series) | 1 |
| | XZB98X126A4 | Cover for the unit (KX-B520 Series) | 1 |
| | PBPQA0005Z | Cushion for the unit | 2 |
| | XZB13X30A04 | Poly Bag for Cushion | 3 |
| | XZB42X90A04 | Poly Bag for Printer | 1 |
| | ZKS3XB5200Z | Cushion Bag for Accessories | 1 |
| | PBPEA0008Z | Frame Cover Cushion Sheet (KX-B620 Series only) | 3 |
| | XZB25X40A40 | Poly Bag | 1 |
| | WZ0XB50EAC0 | Eraser | 1 |
| | MQ0XB55EAC0 | Marker Set | 1 |
| | PBHP5Z | Copy Paper | 1 |
| | PBQX50060Z | Operation Manual (U.S.A. version) | 1 |
| | PBQX50061Z | Operation Manual (other version) | 1 |
| | PBQX50062Z | Installation Manual | 1 |
| | PBQX4Z | Note for Fastener Attachment (U.S.A. version only) | 1 |